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TREATMENT OF FRESH COMPOUND FRACTURES AND WOUNDS*

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The purpose of this paper is to present my own views on what appear to me to be the controversial points concerning the treatment of fresh compound fractures and wounds. Many people will not consider that there is any room for controversy about some of the points I raise, but recent discussions and a review of the literature on the subject have produced widely divergent opinions on all the questions dealt with. It is only by constant repetition and emphasis of the principles involved in the treatment of these cases, and the establishment of a routine which rigidly adheres to these principles and varies only in their adaptation to suit the individual case, that the best results will be obtained.

Urgency in Treatment

The first point I would raise is the question of urgency of treatment. Most authorities are now agreed that wounds and compound fractures as a class are cases of extreme surgical emergency. A few hours' delay in treatment may make it impossible to prevent infection in the wound, with the resulting danger to life and limb and many months of delay in obtaining healing of the wound and union of the fracture. The optimum time for treatment is usually accepted as being up to six hours. In spite of this, series of cases are being reported for consideration in which the time factor is not mentioned and others in which the only classification with regard to time is as between those under twenty-four hours and those over twenty-four hours (Campbell and Smith, 1941). Also, in journeys round the country I find it almost a constant complaint that those who first see these injuries are not sufficiently aware of the urgent necessity to arrange that the patients receive adequate treatment as soon as possible. The only justifiable cause for delay is the patient's general condition, and, if this is such that transfer is not possible, then *active* measures to restore the general condition must be started at once. No patient with this type of injury should be taken to any hospital where facilities for adequate treatment are not available, put to bed there, and transferred next day or the day after, as so often happens.

The question of urgency of treatment is very intimately bound up with resuscitation. When any patient is admitted with a serious wound or compound fracture, resuscitation should be started at once without regard for his condition. In hospitals that receive these cases early, many of the patients will be in good condition on admission, say an hour after the accident. This fact is noted, and the patient is sent to the ward and the process of arranging the anaesthetist, theatre, etc., set in motion. In most hospitals this takes about an hour (usually more at night), and by the time the patient comes to the theatre there will probably have been a marked deterioration in his condition. A patient with an obvious compound fracture should not stop in the admitting department at all, but should go straight to a warm ward. The necessary sedative should be administered, and the limb should be splinted *as it lies* if this has not already been done. I stress this point as it is still being recommended that gross compound fractures should be pulled into line by the first person who sees them or immediately on admission (Venable and Stuck, 1941). Early splintage is essential, but where there is contamination of a compound fracture no attempt should be made at reduction until the wound has been excised. Within the last few weeks I have amputated a leg for gas gangrene. This amputation was undoubtedly rendered necessary by the fact that too early reduction made it impossible for the surgeon to determine the extent of the excision required. When sedative and splintage are in order a plasma drip should be started. The rate of flow may be decreased or accelerated to suit the needs of the case, and the plasma may be changed to blood as required; but this is an essential part of the resuscitation in all patients with any serious wound or compound fracture, and should always be done before the patient comes to the theatre. In my opinion plasma should not be given in large quantities. Several patients who received more than two pints of plasma suffered from a post-operative anaemia out of all proportion to the blood loss and dilution effect of the plasma. A rule has been made, therefore, that in any case requiring more than two pints of fluid, blood should be given instead of plasma after the second pint.

With regard to the preparation of the skin before operation, there is no principle involved here, and any one of several methods may apparently be used with success. In the present stage of our knowledge of antiseptics there seems to be a great deal to be said for the use of soap and water only. With the wound covered with sterile gauze the skin round about can be cleaned with soap and water, and the preparation of this skin should be likened to the preparation of the surgeon's hands. If this is done with care there is no danger of adding infected material to the wound. The surface of the wound should also be washed with soap and water. This removes surface dirt and helps to differentiate between dead and living tissue. Flushing of the wound with large quantities of saline, as recommended by some authorities, is to be avoided.

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Excision of Wound

The next stage is the incision and excision of the wound. It seems necessary to mention that a tourniquet should never be maintained in place during this procedure. This excision should include the removal of all tissues which have been robbed of their blood supply. This rule should be applied to each layer in turn, a fact which was first stressed by Gray (1915) and by Milligan (1915) during the last war and amply verified since. Any surgeon who fails to do this will have cases of gas gangrene and spreading infection no matter how much he tries to lean on what I like to call the aids to surgery—sulphanilamide, sera, *x* rays, etc. To follow this rule may mean in some cases very extensive incision of soft parts. It is *essential* that this should be ruthlessly carried out. Skin, subcutaneous tissue, muscle, or bone that has been robbed of its blood supply not only will never again be any use to the patient but is the ground prepared by the injury in which the organism will grow. The removal of bone should be conservative, and only fragments that are completely detached from periosteum and muscle or are definitely contaminated should be removed. I would like to quote two instructive examples of the results of failing to adhere to this rule. In two cases seen recently, in which children experienced injuries to skin of the thigh, limited excision was carried out within a few hours and the wounds were closed with drainage, a gauze dressing, and a bandage. Both developed gaseous gangrene of the cellular subcutaneous tissue. In one case it was fatal, and in the other very nearly so. On a recent visit to a neighbouring city I was shown a fresh compound fracture of the tibia and fibula about to be operated on with the object of doing an excision and carrying out "closed-plaster" treatment. The limb was found to be severely injured, and there was no trace of circulation below the level of the wound. This is an example of the type of case in which the only satisfactory excision is amputation and also of the type in which gangrene is said to occur as a result of "closed-plaster" treatment. The fresh wound to me means a wound in which infection is not already established. To fail to excise a wound because it is more than six hours old is to deny the principle of excision. If gas gangrene develops, the first treatment is to excise the involved muscle, so if a wound which is first seen when twenty-four hours old obviously contains dead tissue it is a mistake to wait for the infection to develop and then do the excision. After approximately forty-eight hours the Winnett Orr principle of incision and drainage is usually sufficient, as if no gas gangrene has developed in an untreated wound within that time it is not likely that it will do so.

I need not dwell on the details of the excision. It is a surgical procedure in which any surgeon undertaking this work must make himself thoroughly proficient. It is, however, necessary to stress again the importance of incision as an integral part of the procedure and also that to put a dye into the wound and excise a certain distance in all directions is to display a complete ignorance of the principle involved.

The Question of Suturing

The next question that arises is whether or not the wound should be sutured. In civilian injuries, when the operation is carried out within six hours and the suturing can be done without any tension on the skin, it is advisable to suture the wound. Six hours is the accepted maximum, but the sooner the better. In wounds of more than six hours' duration, and those in which tension is necessary to bring the wound edges together, no sutures should be used. I mention the skin only because it is generally agreed that, with the exception of ligatures and stitches to close a joint, no deep stitches should be used. It must be stressed here that conditions in which it will be safe to do a primary suture very seldom arise in war surgery.

Most people will put sulphanilamide into the wound whether it is sutured or not. To the best of my knowledge there is no conclusive evidence that this procedure is of any value. Many papers based on animal experiments and also on clinical impressions have been published indicating its value, but nowhere have there been recorded comparable series of cases treated by the same surgeon with and without local sulphanilamide. Until this is done—and the report must include the bacteriology of the wounds as well as the clinical state—we shall not know what value, if any, there is in local application of the sulphonamides. I have recently seen it stated by three separate authors that local sulphanilamide tends to delay healing. This again is based on clinical impressions, but is worthy of note because these drugs are being used so freely. In the present state of our knowledge the surgery is the important part of the treatment of the wound.

Applying the Plaster

If the wound is not sutured I prefer to use dry gauze in the wound, provided no infection is already established. The deepest layer should be gauze or bandage of very fine mesh to minimize its permeation by granulation tissue. Plaster is applied immediately over the gauze. Dry gauze and plaster will exert a mild suction on the wound and assist the escape of any haematoma. The discharge is transmitted through the gauze, and, provided there is no infection when the plaster is removed, it is often found that, although the plaster is stained with blood over a wide area, the gauze underneath is not appreciably blood-stained and is dry. If infection is already present then vaselined gauze provides the required drainage equally as well as dry gauze. The limb should be immobilized, including one joint above and one below the site of the wound or fracture. Whether the plaster is applied to the skin with only the bony prominences padded or whether a continuous layer of padding is used will depend on the local custom and also, I am afraid, to some extent on the erroneous assumption that the bit of padding gives a wide margin of safety and therefore allows of less care in the application of the plaster. The worst plaster sores I have ever seen were under padded plasters, and if the absence of padding will make people take greater care in applying plasters, that in itself is sufficient argument for not using padding. If the surgeon feels that he must use padding under the plaster, he must be sure that whatever padding he uses is highly absorbent. Much of the cheap plaster wool padding in use is non-absorbent, and although it is satisfactory for simple fractures it defeats one purpose of the closed-plaster treatment of wounds.

The next question is whether or not windows should be cut over the wound. When a wound is left open no window should be cut, as if one is cut the protection against infection afforded to the wound by the plaster is removed. Unless the plaster is completely soaked with pus no change will occur in the bacterial flora on the wound while the plaster remains intact. Also the granulations that form will be of a poorer quality, more exuberant, and more oedematous if the uniform firm gentle pressure of the plaster is removed.

If the wound is stitched and remains uninfected there is no need to cut a window, but the window will do no harm. There should be no need to cut a window to watch a stitched wound, as this suggests doubt on the part of the surgeon as to his wisdom in stitching, and if there is

doubt the wound should be left open. This was demonstrated during the last war by Forbes Fraser (1918), who obtained 84% primary healing of secondary sutures and only 66% primary healing in primary suture of wounds ten to twelve hours old.

Sera, Sulphonamides, and X Rays

Having discussed the local aids to surgery, the next problem that arises is the general aids such as sera, sulphonamides, *x* rays, etc. The use of tetanus toxoid may sometimes make A.T.S. unnecessary as a prophylactic, but at the present time it should be employed in all cases. It is my own view, and one that is held by most writers on the subject, that no anti-gas-gangrene serum is of any value as a prophylactic. The prophylactic use of sulphonamides in post-operative treatment of fresh wounds is also to be deprecated, especially the routine use of sulphapyridine—a common practice. Following treatment of a fresh wound, to start the patient on a course of sulphonamide is an admission of failure. In those rare cases in which the patient's temperature rises above 100° and there is evidence of infection of the wound the surgery has been faulty and the wound should be inspected to see that dependent drainage is present; the infecting organism should be determined and the appropriate sulphonamide prescribed. For instance, to use sulphanilamide in a staphylococcal infection or sulphapyridine or sulphathiazole in a *B. welchii* infection is not making the best use of chemotherapeutic agents. It is not difficult to keep abreast of current knowledge on the potency of these drugs against particular organisms, and it is the duty of anyone employing them to do so.

The routine prophylactic use of *x*-ray treatment against gas gangrene seems to me to be unnecessary (Thomson, 1940). No one has produced definite evidence to show that the procedure is of any value. There is also no doubt that the bone marrow is in danger when sulphonamides and *x* rays are used in conjunction.

One point which is cited against the use of the excision-incision closed-plaster technique is that it makes the early diagnosis of gas gangrene difficult. There are two observations that I would make on that assertion. The first is that gas gangrene starts most commonly in three regions in the body—the calf, the thigh, and the shoulder. If the surgeon is in doubt as to the efficiency of the excision and incision in wounds of these areas with extensive muscle damage and gross contamination, he should refrain from applying plaster for forty-eight to seventy-two hours. If by that time no infection has developed, plaster may be applied. The second observation is that too little stress is laid on the general symptoms and signs in the early diagnosis of gas gangrene. In the earliest stage there is usually a clear change in the general condition of the patient, and if this change is noted and acted upon *directly it occurs* the diagnosis will be made just as soon as it will be by repeated inspection of the wound.

Although serum is of little or no value as a prophylactic, it is of considerable value in treatment of gas gangrene provided that it is given in adequate doses. By adequate doses I mean in the neighbourhood of 100,000 units in twenty-four hours in an adult and equivalent doses in children. It should be given intravenously in a continuous drip of blood or plasma. Because of the alteration of acid-base balance it is also advisable to give adequate doses of sodium bicarbonate whether or not sulphonamides are being used. There is some evidence to support the fact that *x*-ray therapy is of value in the treatment of gas gangrene (Kelly and Dowell, 1941). I have no personal experience with the results of such treatment.

Results in a Series of Cases

Now, in conclusion, I would like to make some observations on 31 cases of compound fractures and wounds involving joints treated in this unit during the last three months. The observations are almost entirely concerned with the results of treatment of the wound, as in these cases if wound treatment is successful that of the fracture usually gives no trouble.

These cases include: 3 wounds of thigh involving knee-joint; 2 wounds of arm involving elbow-joint; 2 wounds of arm involving shoulder-joint; 2 cases of extensive laceration of hand; 2 cases of compound fracture of radius and ulna; 1 case of compound fracture of humerus; 2 cases of laceration of foot with compound fractures of tarsal and metatarsal bones; 12 cases of compound fracture of tibia and fibula (3 bilateral); 2 cases of compound fractures of patella (1 bilateral); 1 case of compound fracture of femur, tibia, and fibula; 2 cases of compound fracture of femur.

These cases are not selected in any way except that technically compound fractures and minor wounds have been omitted. In this series there was one death: the patient had compound fractures of both tibiae and died of head injuries within twenty-four hours.

The points to which I would like to refer concerning these cases are: post-operative temperature, length of stay in hospital, and general comfort of the patients. All these patients were treated according to principles outlined—some by me and the rest by other members of my staff. With the exception of two, all were operated on within six hours of the injury. In 13 cases incomplete suture (i.e., suture of the incision only) was carried out, and in 4 cases no sutures were employed. Local sulphanilamide was used in the wound in some of the cases but not in all. We are at present investigating wounds treated with and without sulphanilamide and hope to have something of interest to report at a later date. In only 3 cases was a sulphonamide administered orally or by injection. In one, that of an airman with severe multiple injuries, including bilateral compound fractures of the patellae, which had been excised and sutured elsewhere, the right knee became infected. The second was a compound fracture of tibia and fibula complicated by a *Staph. aureus* infection of the wound, and the patient had a temperature of 101° on the second and fifth days. The third developed a basal pneumonia as a result of the fracture of four ribs. The compound fracture of the tibia and fibula gave no trouble. In the remaining cases the maximum post-operative temperature was less than 100°, with the exception of one case in which the patient had a temperature of 100° on the second day but was otherwise below 99°.

The average stay in hospital for all these cases was seventeen days. Six of the patients were transferred to other hospitals, but in no instance within the first fortnight.

I would like to mention one other point, and that is the question of smell. All these cases were put in plaster, but in only one instance was there any complaint about the smell. In this case, that of a boy with a severe compound fracture of the femur, a wide excision including skin was necessary. There was considerable discharge from the granulating surface, and the smell of the plaster was objectionable.

Comment

This series of cases shows that by applying the principles previously described it is possible practically to remove the bugbear of infection in the treatment of fresh wounds and compound fractures. This, along with the absence

of repeated dressings, adds greatly to the patient's comfort, and the time spent in hospital is reduced to a minimum.

Summary

The treatment of compound fractures and wounds is a matter of extreme urgency. Resuscitation should be started directly the patient reaches hospital in all cases, and operation should be carried out as soon as the general condition permits. With regard to the operation, the skin should be prepared with soap and water, and the use of antiseptics in the wound should be avoided. The principles of incision and excision of the wound should be carefully followed. No wound that is of more than six hours' duration should be sutured; also, no sutures should be inserted that exert any tension on the skin margins. Local sulphanilamide may be used to advantage following adequate surgery, but to use it in an effort to replace adequate surgery is to court disaster. The general prophylactic employment of oral sulphanilamide is unnecessary. The value of anti-gas-gangrene serum as a prophylactic is doubtful; in treatment it is beyond doubt. Finally, 31 cases of compound fractures and wounds are recorded with special reference to post-operative temperature and length of stay in hospital.

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GASTRIC LAVAGE IN THE DIAGNOSIS OF TUBERCULOSIS IN CHILDREN

A SURVEY OF 75 CASES

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Meunier (1898) was the first to recommend gastric lavage and the investigation of stomach contents for tubercle bacilli. Armand-Delille (1927) reported a study of 110 tuberculous children investigated by this means. He found 31% of the stomach contents positive for tubercle bacilli. Since then articles on the subject have often appeared in the literature of America and the Continent, but in this country it is only of recent years that the method has been used to any great extent. Collis and Brockington (1933) published their results in 70 children and infants under the age of 11 years. Their series consisted of 52 cases of definite or suspected pulmonary tuberculosis and 18 contacts. Tubercle bacilli were found in 12 of them. Munro (1938) in a survey of 82 children up to 13 years of age found positive results in 22 cases. In 13 of these the bacilli were of the human type, in the remaining 9 of the bovine type.

Present Investigation

The investigation was carried out at the Adelina Patti Hospital of the Welsh National Memorial Association. 75 cases were under review, consisting of children of both sexes, aged from 2 to 11, admitted to the hospital during the past two years. They included 64 pulmonary or observation cases and 11 non-pulmonary ones. So far as possible all cases of faucial, nasopharyngeal, and middle-ear tuberculosis were excluded. This was done to obviate any chance of obtaining a positive result from the discharge swallowed from any of these sources.

Method Used.—The technique is simple, and no real difficulty has been experienced. The apparatus used is a No. 10 catheter joined by a glass connexion to a piece of rubber tubing fitted with a glass funnel. The stomach is washed out in the morning after the child has fasted for fourteen hours. The apparatus is sterilized and connected together beforehand. The child sits on a table and is supported by a nurse, who also holds the child's hands. To prevent biting of the tube a spatula is placed over the lower teeth. The end of the catheter is lubricated with sterile glycerin. The child is told to swallow and at the same time the catheter is passed. When it is in the stomach a nurse pours sterile water through the glass funnel, and this is immediately allowed to flow back into a sterile bowl by means of siphonage. The process is repeated several times, using in all about 200 to 300 c.cm. of sterile water. It has been found more convenient to pass the catheter through the mouth than through the nose. Particles of sputum are often observed in the returning fluid. The whole procedure takes about five minutes, and is accompanied by the minimum of inconvenience or tears—so much so, that one patient aged 3½ years used to give an exhibition of how to swallow the tube for the benefit of others who were to be done later. The contents are put into sterile bottles and dispatched on the same day to the Central Tuberculosis Laboratory at Cardiff, where a direct examination is made by the Ziehl-Neelsen method, after concentration, cultures are set up, and guinea-pig inoculations are done. Owing to the wartime shortage of guinea-pigs it has not been possible to inoculate in every case.

Family History.—A history of contact with open cases of pulmonary tuberculosis in father, mother, sister, or brother was obtained in 46% of the patients. In some of the remainder a remote family history in grandfathers, grandmothers, uncles, etc., was elicited, but as there was no intimate contact the family history was regarded as clear.

Symptoms and Signs.—Of the 64 pulmonary or observation cases 40 had symptoms and 24 had none. The predominant symptoms were cough and malaise. Physical signs were present in 40 cases. In the other 24 no physical signs could be found. In 2 the first sign was erythema nodosum. In many the signs and symptoms were vague and indefinite and by no means distinctive of pulmonary tuberculosis.

Tuberculin Test.—All the 75 cases were tuberculin-tested on admission, either by the Mantoux method, using 1 in 10,000 tuberculin, or by the patch test (Vollmer). The result of the test was read as strong, medium, mild, or negative, according to the reaction obtained. Where no reaction was obtained by the Mantoux 1 in 10,000 or the patch test, Mantoux 1 in 1,000 was used, but in only a small proportion of the cases was this necessary. A strong positive reaction was obtained in 22 cases, 20 gave a medium reaction, and 29 gave a mild reaction: 4 cases were completely negative to 1 in 100 tuberculin.

Radiological Appearances in the Pulmonary or Observation Cases.—Parenchymal lesions were apparent in 35 cases, dense nodes and enlarged root shadows in 19, and pleurisy in 6 (two with effusions; 4 cases were regarded as radiologically within normal limits.

Results of Gastric Lavage

Tubercle bacilli were found in the gastric contents of 24 cases (Table I). A positive result was not obtained in any of the non-pulmonary cases. The tubercle bacilli found were all of the human type. It is interesting to note here that positive results were obtained in both cases of erythema nodosum.

TABLE I.—*Details of the 24 Positive Cases*

Age Group	No. of Cases	Bacteriological Examination				Tuberculin Test		
		Direct	G.-P. and Culture	G.-P. only	Culture only	Strong	Medium	Mild
2–3	4	1	1	3		3	1	
3–4	5	1	2	1	2	3	2	
4–5	2		1		1	1	1	
5–6	5		3	1	1	5		
6–7	1		1			1		
7–8	2		1		1	2		
8–9	1		1				1	
10–11	4	1		2	2	2		2

It will be noted that a positive result was obtained in 24 (37%) of the 64 pulmonary or observation cases. Tubercle bacilli were found in 3 specimens on direct examination after concentration. 10 were positive on culture and guinea-pig inoculation, 7 on culture only, and in 7 a positive result was obtained after guinea-pig inoculation only. It is recognized that a positive result on direct examination should not be accepted unless confirmed either by culture or by guinea-pig inoculation. In our series the three positive results on direct examination were also positive on culture or guinea-pig inoculation.

TABLE II.—*Radiological Appearances in the 24 Positive Cases*

Case No.	Exaggerated Roots. Dense Nodes in Roots or Lung Fields	Lung Parenchyma	Septa	Pleura
1		Medium mottling in right upper and middle zones		
2		Dense shading in right mid and lower zones		
3	Right and left root shadows much enlarged	Streaky shading right base		
4		Homogeneous shadow right parahilar region, fading towards periphery		
5		Medium shading right lower zone		
6		Left costo-phrenic angle lost. Some shading in paramediastinum and apex	Right interlobar septum visible	
7		Fine mottling right upper zone. Opacity along periphery of left lung. Costophrenic angle obliterated		
8		Mottling in right upper and mid zones		
9		Shading left apex		
10		Dense shading right lower zone		
11		Medium mottling right and left upper and mid zones		
12		Ground-glass opacity left upper and mid zones		
13		Fine shading all zones both lungs		
14		Medium mottling right upper and mid zones		
15		Medium shading towards right base and in 2nd space		
16		Small area of dense shading 4th space right		
17		Area of medium shading 4th and 5th spaces right		
18		Fine mottling all zones both lungs		
19	Right root enlarged	Fine mottling at right base		Thickening of pleura
20		Shading left parahilar region		
21	Right root enlarged	Primary focus 2nd rib right	Left interlobar septum visible	
22				Right pleural effusion
23		Streaky shading in 2nd right intercostal space		
24				Left pleural effusion

From Table II it will be seen that a parenchymal lesion was present in 22 of the positive cases and pleural effusions in the remaining 2. The type of lesion varied in size and position from a focus of minimal extent to definite mottling. It is noteworthy that in 14 cases the lesion was situated in the right lung field, while 4 had lesions in the left lung and 4 others had bilateral involvement.

Discussion

Our conception of tuberculosis in the adult is that of a disease characterized by symptoms and signs such as cough, expectoration, etc., physical signs in one or both lungs, radiological changes in the same areas, and tubercle bacilli in the sputum. These as a whole are so rarely present in children, except in a child who has the adult type of disease, that a definite diagnosis is very often difficult to establish, especially when the only evidence of infection is a positive tuberculin test. In most of these cases sputum is not obtainable in the ordinary way, either because children do not cough or because they are too young to expectorate.

It is recognized that as the child approaches adolescence a positive tuberculin test loses its significance unless a previous test has been known to be negative. It is generally agreed, however, that in infancy and childhood a positive tuberculin test is of pre-eminent importance. It will be noted that in 16 of the positive gastric lavage cases the patients were between the ages of 2 and 6 years, that in 12 of them the tuberculin test was strongly positive, while in the remaining 4 a medium reaction was obtained.

When a positive tuberculin reaction is obtained in a previously negative reactor, and this is accompanied by a radiological lesion in the lung, then the lesion in most cases is a tuberculous one and primary in character. In the absence of this information a parenchymal radiological lesion and a positive tuberculin test do not always justify a definite diagnosis of tuberculosis. A reliable laboratory method for making a diagnosis in such cases is greatly needed. The examination of the faeces for tubercle bacilli in children has not given uniformly favourable results.

Since the work of Meunier an increasing number of workers have reported favourably on gastric lavage as a diagnostic method. This is therefore recommended because of the need for an accurate diagnosis and because, as mentioned earlier, sputum is unobtainable in infants and young children. As so many of our cases gave no clinical evidence of pulmonary disease and showed a minimal radiological lesion, we would have hesitated to make a definite diagnosis were it not that a positive result was obtained after gastric lavage. The importance of this addition to our diagnostic armamentarium cannot therefore be too highly rated.

Our results have shown that tubercle bacilli were present in 22 of 35 cases with parenchymal lesions. In the remaining 13 cases we failed to find tubercle bacilli in the gastric contents. We feel that positive results might have been obtained in these if the gastric contents had been examined on successive days as suggested by Poulsen *et al.* (1929).

There are two possible explanations for the negative results in these cases: (1) The gastric lavage was done in the early stage of the lesion, before tubercle bacilli were discharged into the bronchus. We recommend, therefore, that the method should be used frequently during treatment. (2) The length of time the lesion had been present in the lung before coming under observation, with the consequence that the process of healing has started and the lesion is shut off from its communication with the bronchus.

A positive result at once raises the question whether these children should be regarded as infectious and therefore be segregated. This implication has not yet been fully estimated, but we feel that a child with tubercle bacilli in its stomach contents should be held to be infectious and that such a child should not be considered to be non-infectious until repeated negative results have been obtained.

Happily, the clinical course of the disease in children is favourable, the lesion either gradually resolving completely or leaving evidence of calcification or of fibrosis.

Summary

The results of the examination for tubercle bacilli of the gastric contents of 75 children are reviewed.

Positive results were obtained in 37% of 64 pulmonary or observation cases.

Negative results were obtained in all non-pulmonary cases.

The tubercle bacilli present in the gastric contents were all of human type.

The presence of tubercle bacilli in the gastric contents establishes a definite diagnosis.

Segregation of such cases is advocated.

Gastric lavage should be a routine diagnostic measure.

It should be done on successive days, and frequently during treatment.

We are greatly indebted to Dr. D. W. Fenwick Jones, medical superintendent of the Adelina Patti Hospital, for allowing us the use of the case records and for much valuable advice and assistance. Our thanks are also due to Dr. D. A. Powell, principal medical officer, Prof. Tytler and Dr. Ruth Milne of the Central Tuberculosis Laboratory, and to Sister Powell, who carried out so successfully the actual procedure of gastric lavage.

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GROUP PSYCHOTHERAPY

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During one year's psychotherapeutic work at the Runwell Hospital for Nervous and Mental Diseases and in the Clinics of the Southend General and East Ham Memorial Hospitals I treated 70 neurotic and early psychotic patients with deep and intensive psychotherapy. Of these patients 87% were cured or sufficiently improved to be discharged. I would like to make some observations on the methods employed in an attempt to show that group psychotherapy is more practicable than has been believed hitherto—and, here at the outset, may I make clear the distinction between three different terms I use: *Analysis* will refer to all methods and degrees of analysis, except that particular method introduced and practised by Freud and his followers, for which *psycho-analysis* is reserved. *Psychotherapy* is, of course, used to designate any or all of the existing psychological methods of treatment.

Disadvantages of Freud's Method

Freud, in his revolt against the overpowering influence of the physician on the patient which results from hypnosis, tried by his analysis to create a form of treatment in which the personal influence of the physician was at the minimum, but which had the great disadvantage that the treatment became so lengthy that it was impracticable for most people. There were three other disadvantages which reduced the usefulness of Freudian psycho-analysis:

1. Nearly every neurotic and psychotic is, as part of his illness, in a state of *reduced activity* (activity in the sense of participation in the different spheres of social life). To keep him in this state—as he must be kept, because the psycho-analysis lasts so long—will probably help him to make that unhealthy state a chronic one.

2. Every neurotic or psychotic is unable to be independent. He has either never gained his independence or he has lost it. To keep such a patient for a long time in dependence upon a psycho-analyst simply tends to make this state, too, a chronic one—even, unfortunately, in many cases an incurable one.

3. The type of patient who is, *a priori*, suitable for psycho-analysis is very limited in number, as, apart from considerations of the length of treatment and the heavy expense incurred, many neurotics and early psychotics are not accessible by free association, which is, of course, a basic part of psycho-analysis: also, many of them do not possess the degree of intelligence necessary for a successful treatment by analysis.

Method used in the Present Series

In contrast to this Freudian method, the main features of my system were as follows: (*a*) shortening of the time of analysis; (*b*) the combined usage of individual and group treatment; (*c*) the introduction of a method of situational treatment; (*d*) the introduction of new forms of social treatment; and (*e*) bridging the gulf which often exists between full insight and cure in psycho-analytical treatment.

With regard to the shortening of the time of the analysis, the question arises: Is it possible, in a short time, to get a more or less complete knowledge of the *deeper causes*—i.e., the subconscious background of the patient? The answer seems to be that it *is* possible, but only if one accepts the conception that there is a general attitude exclusive to every individual. A "general attitude" is not the sum of single attitudes, which varies at the moment of the event (this would be behaviour), but is usually a previously fixed and therefore anticipated attitude towards all situations that are met with. It is formed in the first years of childhood, and though later events may modify it, even to an extreme degree, they never change it completely. Where it has become a hindrance to the patient it can be so modified for good by intensive psychotherapy that it will cease to cause him any further trouble.

But how can this general attitude, and through it the subconscious background of the patient, be ascertained? My method was as follows:

All patients are asked to write down their earliest childhood recollections. At first many are doubtful if they can do this, but I have hardly ever seen any who have not been able to do so. They are then asked to write, in instalments, their aims and ambitions (especially between the ages of 10 and 14), their likes, dislikes, and dreams. What I learn from these documents, together with the exact social history, an interview with a relation and two or three sittings with the patient, enables me to get a picture of the subconscious background.

This approach differs from Freud's psycho-analysis in that: (1) It takes into account the whole life—life in the sense of psyche, body, and environment. (2) There is no synchronization in the knowledge of the deep causes of the illness by the therapist and the patient (the therapist knows this first), whereas in psycho-analysis the patient and the physician learn more or less at the same rate. (3) It does not agree that "making conscious" is a means of effecting a cure, even by way of transference and subsequent solving of the transference situation, as happens in psycho-analysis. (4) It avoids the Scylla and Charybdis of the theory of symbolism which is so general, on the one hand, and the interpretation of the psycho-analyst which is so personal, on the other, by assuming that there is one "general attitude" in every person (this being an individual but at the same time stable factor).

This approach uses the process of analysis, but the reason why psycho-analysts did not employ it is that in a short analysis the psychotherapist gets the knowledge of the deeper background but the patient does not. Diagnosis is therefore not identical with cure—and in order to obtain a cure the psychotherapist would somehow have to transfer that knowledge to the patient, would have to lead him, and would endanger the treatment by becoming an overpowering factor.

Situational Treatment

In order to avert that danger a new avenue must be found. This new avenue, in my opinion, is situational treatment, which must be clearly distinguished from institutional treatment. Under "situational treatment" I

include any individually directed but *impersonal* measures undertaken by the psychotherapist and his assistants with the aim of achieving a certain change of attitude in the patient, they having a full knowledge of the *analytical* background of that particular patient while he himself is ignorant of it.

In situational treatment the patient does not get knowledge about his subconscious, but he *experiences* the situation which makes him change his attitude. For example, let us say that a boy is afraid to swim: he is afraid because he believes he cannot swim; he cannot swim because he is afraid. The longer he stands on the edge of the water the more frightened he becomes, and that is a vicious circle. I do not say that a long-standing psycho-analysis would not have the effect of making him jump into the water and try to swim; in some cases it certainly would produce the desired result, but this can, however, be procured in a simpler way. A clever swimming instructor who understood how to put the boy into the water could turn him on his back in such a way that he would be completely convinced that no harm could come to him so long as he was supported by the strength of the swimming instructor who was holding him; for the boy who before was so frightened would have found out that it was possible to lie on the water without doing anything, and without sinking: his fear would disappear, the vicious circle would be broken, and the teaching of the strokes would become much easier than if the instructor had first tried to teach them without taking into consideration the natural—or in many cases the completely abnormal—fear. Lying on the strong hands of the teacher would convince the boy much more than the most clever argument or the longest analysis. "Situations" which occur in everybody's life and which influence lives decisively can be artificially arranged, as in this instance, and so can become an important method of psychotherapy.

By "institutional treatment" we understand any impersonal measures undertaken by an institution or its agents —having sometimes a knowledge of the *state* of the individual patient (but without the knowledge of the analytical background necessary for situational treatment)—with the aim of achieving a certain change of attitude in him. Occupational therapy by itself is *institutional* treatment; but special occupational therapy chosen in accordance with the analysis of that particular patient, and managed or led to meet the analytical desires of that patient, is *situational* treatment.

An 18-year-old schizophrenic, who was dressed and fed by his mother for his whole life, and could not therefore achieve the slightest independence from her, was treated successfully by specially arranged occupational (i.e., situational-occupational) therapy in the following manner:

In order to allow the patient to develop his strong desire for identification with his father, it was arranged that the psychotherapist should take him as his assistant to work in the patients' garden and, by letting him act as leader of the gang working there, should give him the opportunity of experiencing the strong-father identification for which he had longed. It is easy to see in this case that analysis had to be performed and the special situation arranged so that through identification with the strong male personality (i.e., the psychotherapist) the patient was enabled to become active and so, without knowledge but through the process of the situation, to achieve the independence the lack of which was the cause of all his symptoms.

Again, to take another example, physical training by itself is institutional treatment, but if, as in occupational therapy, it is used in the individual and analytical way it can become *situational* treatment.

A woman aged 26 was for many months in a mental hospital with the symptoms of severe claustrophobia. She could not move outside the hospital, and, in spite of the length of her stay there, did not show any signs of improvement. She was very quiet and dull, and not very sociable. She had not had a strict upbringing; on the contrary, she had been very much spoilt by her mother. Before coming to the hospital she was a shorthand-typist in a lawyer's office. No approach, whether by psycho-analysis or by individual psychotherapy, had been in the least successful. The girl had obtained her situation by replacing her sister when she married. It was found out, after a time, that she was unhappy in her work, and the reason for her unhappiness was that her employer, the lawyer, was foolish enough to tell her nearly every day how wonderful her sister had been in the same employment.

Her one desire in life was to become a teacher of physical training (this aim had really some deeper connexions with her mysterious father, who appeared only once in a few years, merely to disappear again in the same way after a short time), and although she was shy, unintelligent, and unsociable, she was put into the physical training department as assistant to the teacher. She made such good progress that after a few months, even before she was completely cured, a post was found for her in another mental hospital in Scotland, as assistant to the physical training teacher there. To the surprise of everyone concerned, the shy girl undertook the long journey to Scotland, accepted the post, and after about a year passed her preliminary examination, by which time the claustrophobia had completely disappeared.

The Social Club

An important factor in situational treatment is the social treatment, and especially the self-governed social club as it was run in Runwell Hospital. Entertainments for patients are arranged in all modern mental hospitals: that is *institutional* treatment. The basis of the "social club" idea is just the opposite: nothing is arranged *for* the patients, but everything is arranged and governed *by* them. By that one change a fundamental vicious circle is broken. When people get depressed or maniacal they must be shut up in mental hospitals because they are a danger to themselves or to others. Shutting them up gives some of them the proof that they are right in imagining themselves to be very ill. Some get stubborn and violent because they have no insight and do not want to be in the hospital: the more violent they become the more necessary is it to keep them in solitary confinement; the more they are segregated the greater is their violence; and so forth. To break that vicious circle involves accepting great responsibility. Many hospital authorities have already discovered that it is easier for the administration of the hospital and better for the patients' health if they are all set to work; but there is still considerable hesitation in using restless or violent patients, especially for outdoor tasks. During a whole year of working with restless and violent patients (about thirty of them, with one attendant), and they using their normal garden tools, we did not have one accident, apart from a few efforts to escape. This courageous occupational therapy is one means of breaking the vicious circle. The social club is another.

A patient who was suffering from melancholia of many years' standing, and who was completely inaccessible, was so influenced by a concert arranged in the ward, and by a singer, that she got out of bed for the first time, and herself began to sing. From that moment she began to improve very slowly, and in course of time became an active member of the social club, so that she was able to be decertified and discharged from the hospital a few months later. When she came to see me a short time ago she said spontaneously: "Do you know, Doctor, when I first began to make rapid progress? It was when I went to the social club—when I felt 'I am no longer a nobody.'"

This expression does show forcibly how we forget that when patients are admitted to a mental hospital they are stripped of all their responsibilities, deprived of all independent action, and are in no way self-governing—in fact, they are made into "tools." The social club should be

the first important step towards making the patient change his position from that of being an *object* to being a *subject*.

The social club is a part of the group treatment, by which we understand all measures in which more than two people co-operate and which are taken to prevent or heal psychological illnesses. Apart from the whole activity of the social club (which includes all kinds of entertainments, sports, games, and meetings, and the writing and printing of the patients' own magazine, etc., which are entirely inaugurated and governed by the patients themselves) it has one meeting over which the psychotherapist presides. Take as an example the club at Runwell Hospital—about 50 to 100 people take part in this particular meeting, which consists in discussing problems of personal importance, but in an impersonal way. The psychotherapist has to be as passive as possible, and takes part only when it is necessary to become active—as, for example, to contradict an unsuitable remark, or to finish a controversy between two very active members, or if it is found to be important from a therapeutic point of view, through questions, to make a passive member become more active, or to summarize the findings of the discussion and to put them before the meeting in a lucid manner.

Another form of group treatment that is used is the "circle." This is a weekly gathering of about ten patients (male and female together) at which the difficulties of one of the patients, who is present, are discussed, but never in a form in which any other patient would know whose problem it is, and in most cases in such an impersonal way that even the patient concerned does not become aware that it is his own problem. From my experience I have found that it is more beneficial to the patient if he feels only a similarity but is not consciously aware that it is he who is being discussed.

Experiments in Group Psychotherapy

As to the practical usage, we must say that, although the first experiments were made in 1905 by Pratt, group psychotherapy is not much used and is still in its infancy. The different experiments should be classified as follows:

Mass treatment, which consists in the overpowering of great numbers of people—as, for example, in mass hypnosis and mass suggestion (Brauchle).

Class treatment, which consists in trying to convince people by means of teaching, given in the form of lectures. This method was inaugurated by Pratt and Lazell, and continued by Buck, Harris, Sommers and Pouppirt, and Snowden.

Collective treatment, which includes all the systems that aim at more than superficial overpowering or teaching. They include: (*a*) group psycho-analysis, as used by Schilder and Wender; (*b*) group activity as a combination of institutional treatment, plus teaching, as used by Marsh; (*c*) collective living together, as used by Emerson and Slavson; (*d*) the situational treatment.

Advantages claimed for Group Treatment

The following advantages are mentioned by the different psychiatrists who used the various forms of group treatment:

Stepping-up of power of suggestion (for instance, in mass treatment, with which I personally do not agree). Spirit of co-operation in a group with a common objective. Fear of analyst removed. Socialization with reference to the fear of death. Patients feel that they cannot be so bad, as there are so many others in a similar state. Loss of self-consciousness. Establishment of rapport with leader. Friendly relations established among the members—of special value for those with limited social opportunities. Adequate therapy can be given to those who cannot afford frequent individual visits. Many employed patients can be seen without interfering with their regular working hours. Re-education of relatives and friends. The patients obtain practical experience in group adjustment and learn to accept responsibility for solution of problems. The psychotherapist has the opportunity of observing the patient in a social situation. Indirect suggestion can readily be given. The group spirit carries the individual over temporary setbacks. Patients are aided in starting outside activities. The patients are roused to activity. Influence on the attendants.

The following advantages, especially so far as situational therapy is concerned, may be added: (1) The gulf between insight and cure which exists so often in psycho-analytical treatment can be bridged. (2) Patients in mental hospitals become independent, active, and "self-deciding," which helps a great deal in speeding up their cure. (3) It is made so much easier for many patients to solve their social problems.

Conclusion

After a year of experimental work it seems to me that the ideal team for applying this group therapy would consist of one expert psychotherapist with five assistants—two young physicians (or even one physician and one medical student who intend to become psychotherapists), two experienced occupational therapists, and one social worker. Such a team could easily treat two or three hundred patients a year and, in addition, could influence in a more superficial way many hundreds of old-standing psychotics. This would bring us a step further towards applying deep and intensive psychotherapy to larger groups of patients both in out-patient departments of general hospitals and to inmates of mental hospitals, and I am convinced that deep and intensive psychotherapy of the masses is nearer realization than heretofore has been thought possible.

Summary

In one year 70 neurotic and psychotic patients were treated with deep and intensive psychotherapy; 87% of them were discharged cured or improved.

This was effected by using a short form of analysis, by a combination of individual and group treatment, and by introducing a method of "situational treatment" and a new form of social treatment.

The results encourage me to believe that psychotherapy of the masses, especially in the combination of short but deep analysis plus situational and group treatment, is nearer realization than has yet been thought possible.

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LUNG TUMOURS IN MICE

INCIDENCE AS AFFECTED BY INHALATION OF CERTAIN CARCINOGENIC AGENTS AND SOME DUSTS

BY

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In previous researches (Campbell, 1934, 1937a, 1937b, 1940) it was demonstrated that the incidence of primary lung tumours in mice may be increased by the inhalation either of tarred road dust, both with the tar and after its extraction, or of brown oxide of iron or precipitated silica, the effect being most pronounced with the tarred road dust containing tar. In continuation of these studies with the intention of seeking for stimulators or inhibitors of lung tumours, the effects of the following have been tested, and the results are given herein: (*a*) precipitated silica containing methylcholanthrene; (*b*) steel grindings; (*c*) a mixture containing equal parts of alumina, precipitated silica, and brown oxide of iron; (*d*) a radio-active dust from Czechoslovakia; (*e*) a mixture containing the same three substances as *c* plus calcium carbonate; (*f*) a further sample of tarred road dust.

Methods

The technique employed was similar to that used in the researches cited above. For each experiment 150 mice were used—75 mice, half of each sex, for the dusted group, and 75 for the controls. Equal numbers of mice of the same colour were placed in the experimental and control groups. The mice were 3 months old, and were obtained from the mixed stock of this institute. The sexes were kept separate, and the mice placed in boxes containing eight to ten animals. The dusted mice were exposed in a closed chamber to a moderate cloud of dust once an hour for six times a day on five days each week for a year. They were allowed to complete their allotted span of life. Histological sections were made of all lungs and tracheo-bronchial lymph glands and of any organ showing pathological change.

Results from Silica plus Methylcholanthrene

The silica (British Drug Houses) was precipitated from sodium silicate by nitric acid, and was the same as that used in some of the previous experiments (Campbell, 1940, 1941). It was proved by *x*-ray analysis at the National Physical Laboratory to be amorphous and therefore without the crystal unit characteristic of quartz. During each day of dusting each box of eight to ten mice received about 500 mg. of silica dust containing 0.8 mg. of finely divided methylcholanthrene. At the beginning of the experiment a small amount of cholanthrene was also present. There is no way to determine accurately the amount of the carcinogenic agent inhaled by each mouse over the whole year of dusting, but the total quantity of methylcholanthrene entering each box of mice was about 200 mg. for the whole year. The majority of the particles and clumps of particles of silica in the cloud measured less than 5 μ.

The dusting produced primary lung tumours in 15 (23.8%) of the 63 mice living 10 months or longer compared with 9 (13.6%) of the 66 similar control mice (Control I)—that is, the incidence is nearly doubled (Tables I and II). One of the tumours in a control mouse had an extension in the tracheo-bronchial lymph glands. Mice younger than 10 months very rarely show lung tumours, and have therefore been excluded from the calculations. There is no doubt that, in mice, age is a factor in the development of pulmonary tumours. In the 15 dusted mice with tumours 8 had single tumours, 6 had two tumours, and 1 mouse had three tumours in the lungs. These numbers are few compared with those of some former experiments, and there is also a diminution in surface (pleural) area and in malignancy. On the average, in the present experiments the surface area of each tumour was only about 3.5 sq. mm., the largest tumour being 25 sq. mm. The tumours of the control group were also few in number and small in size compared with some former controls, and it is apparent that our stock of mice has recently become more resistant to development of pulmonary or any other tumours. Although the incidence of lung tumours was doubled by the dusting, a much greater effect was expected because methylcholanthrene is one of the most potent carcinogenic agents (Twort and Twort, 1939; Iball, 1939), and some previous observers have obtained marked increases in the incidence of pulmonary tumours by apparently very small quantities of methylcholanthrene injected subcutaneously (Andervont, 1939; Grady and Stewart, 1939), administered by mouth (Magnus, 1939; Lorenz and Stewart, 1940), or injected direct into the trachea (Shimkin, 1939). In the present investigation the increase observed was of a degree to be expected by dusting with silica alone (Campbell, 1940), and it is possible that the added methylcholanthrene was present in too small a quantity or had become adsorbed to the silica particles, thus being rendered harmless. Charcoal has been found to act in this way and to hold the carcinogenic agent at the site of injection (Andervont and Lorenz, 1937); there is evidence also that in inhalation experiments carbon has an inhibitory effect (Campbell, 1939). It must be remembered, too, that different strains of mice reveal wide differences in tendency to lung tumours. For some unknown reason the mixed strain of this institute appears to have recently become more resistant in this respect. Such changes may explain why some observers have failed to produce lung tumours by direct insufflation of carcinogenic agents into the air passages (Oberling *et al.*, 1936, with 3 : 4-benzpyrene; Burrows, quoted by Cook *et al.*, 1937, with 1 : 2 : 5 : 6-dibenzanthracene). There is no doubt that by inbreeding of mice it is possible to produce strains either very susceptible or very resistant to production of lung tumours, and in this respect heredity plays a major part.

Results from Steel Grindings

This experiment was undertaken because there is evidence of a relatively high incidence of carcinoma of the lung in metal grinders, engineers, and foundry workers (Kennaway and Kennaway, 1936; Turner and Grace, 1938), and also because dusting with brown oxide of iron increases the incidence of primary lung tumours in mice (Campbell, 1940).

The steel grindings were obtained by grinding down cast-steel files—made of high-carbon-content steel—on a corundum grinding wheel. The filings were passed through a 100-mesh filter, and the majority of the particles in the dust cloud from the resulting powder measured less than 5 μ. Analysis indicated that more than 75% of the dust entering the chamber was iron. There was also a certain

amount of substance from the corundum wheel. The particles were heavy, and every day about 3.5 grammes of dust entered each box, containing eight to ten mice. Certainly some of the very small steel particles remained long enough in the cloud of dust to be inhaled by the mice, since steel particles were present in the lung tissue, damaging the cutting edge of the knife used for section. Microscopical examination indicated that the lungs (Table III) of the majority of the animals contained only a moderate deposit of dust, as did the tracheo-bronchial lymph glands (Table IV), although a few of these glands had heavy deposits. These data for the degree of dusting give a general indication of the condition, since several sections of tissue were examined in each case; but, as serial sections of the entire lungs and glands were not made, the details in Tables III and IV are approximate only.

Among the mice exposed to the steel grindings there were 59 which lived for 10 months or longer, and of these 8 (13.6%) possessed lung tumours, compared with 4 (7.7%) of 52 control mice (Tables I and II). Half of the tumours in each group were malignant, and in one of the dusted mice the tumour gave rise to an extension in the tracheo-bronchial lymph glands. The dusting therefore produced some increase in the incidence of lung tumours, but this was not so great as with the brown oxide of iron (Campbell, 1940), and with the latter the tumours also showed a greater malignancy.

Results from Alumina plus Silica plus Brown Oxide of Iron

Experiments of this type were performed to determine whether certain substances—e.g., aluminium—exhibit an inhibitory effect on development of lung tumours, as has been recorded and confirmed for silicosis (Denny *et al.*, 1937; Naeslund, 1940). The substances (British Drug Houses) were well mixed together in equal proportions, and each day about 500 mg. of the mixture entered each box containing eight to ten mice. Some indication of the degree of dusting was obtained from the deposit of brown oxide of iron as observed by microscopical examination of the lungs, but the alumina and silica could not be seen. The deposit of iron oxide in the lungs was moderate to slight in most mice (Table III), so that the dusting with all three dusts must have been heavy, although some of it may have been absorbed. The tracheo-bronchial lymph glands showed a slight deposit of iron oxide, but of course with the other two dusts the total must have been three times as great, or at any rate considerable. In some cases the silica gave evidence of its presence in the glands by producing fibrotic nodules (Table V). The dusting produced only a slight increase in the incidence of the lung tumours of the mice living 10 months or longer. Thus 9 (15.8%) of the 57 dusted mice and 6 (9.2%) of the 65 control mice possessed lung tumours (Tables I and II); in one of the dusted mice there was an extension into the tracheo-bronchial lymph glands. It is possible that the alumina may have somewhat retarded the action of the silica and iron (Campbell, 1940) in stimulating the growth of the lung tumours, but here again it must be remembered that the control mice appear to have become less sensitive to the growth of tumours.

Results from Radio-active Czechoslovak Dust

In a former research (Campbell, 1940) a dust from the vicinity of the Joachimsthal mine, where the incidence of human lung cancer is high, was tested on mice, and it produced some increase over the controls in incidence of lung tumours. This first sample of dust, however, was not obtained from the active ore of the mines, and therefore did not contain the essentially active products in any quantity. Through the courtesy of Prof. J. Löwy a small amount of the active dust was obtained. This active dust is said to contain usually up to 55% of uranium, 2% of arsenic, and some radium. The sample kindly presented by Prof. Löwy was analysed at the Government Laboratory, London, and was found to contain 53.6% of uranium (as U), 0.6% of arsenic (as As), and radium (as Ra) 0.016 mg. per 100 grammes, equivalent to 160 mg. per ton.

As I did not have very much of this active sample, and as I wished to avoid poisoning with arsenic, the dust was diluted in the proportion of 1 gramme to 20 grammes with the previous and much less radio-active sample of Joachimsthal dust. Every day about 750 mg. of this mixture entered each mouse-box. The deposit of the dust in the lungs was, however, mainly slight to moderate (Table III), but there was in some cases a very heavy deposit in the tracheo-bronchial lymph glands (Table IV). These lymph glands rather surprisingly did not show any pathological change beyond hyperplasia, such as is produced by most dusts not containing carcinogenic agents.

As regards lung tumours there appeared to be a definite increase in incidence in the 64 dusted mice living 10 months or longer, 13 (20.3%) of them having tumours, 8 of which were malignant, while only 1 (2.1%) of the 47 control mice had a tumour, and this a simple one (Tables I and II). The increase, therefore, is tenfold—similar to that with the less active sample (Campbell, 1940); I expected to find more mice with tumours with the more active dust, so that it is possible it had been diluted too much. At the same time I carried out an experiment exposing 20 mice, ten in each of two cages containing a small dish (diameter 6 cm., depth 1 cm.) of the active undiluted dust, so that the animals were continually exposed to the radiation. Half of the mice lived from about 500 to 700 days, and were exposed to the radiations for from 400 to 600 days, yet none of them developed tumours of any organ. The dust was not stirred up inside the cage, and was separated from the mice only by thin wire mesh.

Results from Alumina plus Silica plus Brown Iron Oxide plus Calcium Carbonate

These substances (British Drug Houses) were mixed together in equal proportions, and each day about 500 mg. of the mixture entered each box of eight to ten mice, the particles and clumps of particles of the dust cloud produced being mostly less than 5 μ in diameter. There was no evidence of an inhibitory action by the alumina or calcium carbonate, since there was a definite increase in incidence of lung tumours—12 (19.4%) of the 62 dusted mice living 10 months or longer—and none of the 60 control mice revealed such tumours; 7 of the 12 tumours in the dusted mice were malignant. The deposit of dust in the lungs, in this instance the brown oxide of iron alone, was in most mice moderate to heavy (Table III), so that with the other three dusts there must originally have been very heavy deposits, some of which no doubt was removed by absorption. The tracheo-bronchial lymph glands in most mice contained slight to moderate deposits of iron oxide (Table IV), and the silica revealed its presence in some cases by producing marked fibrotic nodules (Table V).

Results from Tarred Road Dust

In the first experiment with tarred road dust (Campbell, 1934) a ninefold increase in incidence of lung tumours of mice was produced and at the same time most of the dusted mice developed typical cancer of the skin, although the dust was not rubbed into the skin except by the mice themselves.

TABLE I.—*Synopsis of Pathological Data*

Group of Mice	No. of Mice		Mice over 10 Months with Pulmonary Tumours	Mice with Mammary Tumours	Mice (All Ages) with Increase of Lymph Tissue			Mice with Pneumonias
	Original	Living 10 Months or Longer			Bronchial Nodes	Lungs	"General"	
Control I	75	66	9 (13·6%)	0	6 (8·0%)	10 (13·3%)	2 (2·7%)	9 (12·0%)
" II	72	52	4 (7·7%)	4	14 (19·4%)	3 (4·1%)	3 (4·1%)	5 (6·9%)
" III	73	65	6 (9·2%)	0	14 (19·1%)	1 (1·4%)	2 (2·7%)	6 (8·2%)
" IV	72	47	1 (2·1%)	0	10 (13·9%)	3 (4·1%)	1 (1·4%)	10 (13·9%)
" V	76	60	0 (0·0%)	0	7 (9·2%)	0 (0·0%)	0 (0·0%)	5 (6·6%)
" VI	76	69	1 (1·4%)	0	12 (15·8%)	3 (3·9%)	0 (0·0%)	18 (23·7%)
Totals	444	359	21 (5·8)%	4	63 (14·2%)	20 (4·5%)	8 (1·8%)	53 (11·9%)
SiO_2+MeChol.	76	63	15 (23·8%)	0	18 (23·7%)	14 (18·4%)	2 (2·6%)	23 (30·3%)
Steel grindings	75	59	8 (13·6%)	1	33 (44·0%)	19 (25·3%)	1 (1·3%)	19 (25·3%)
$Al_2O_3+SiO_2+Fe_2O_3$	75	57	9 (15·8%)	0	39 (52·0%)	18 (24·0%)	3 (4·0%)	21 (28·0%)
Czechoslovak dust (2)	74	64	13 (20·3%)	1	26 (35·1%)	9 (12·1%)	2 (2·7%)	16 (21·6%)
$Al_2O_3+SiO_2+Fe_2O_3+CaCO_3$	77	62	12 (19·4%)	0	31 (40·3%)	12 (15·6%)	3 (3·9%)	15 (19·4%)
Tarred road dust (2)	76	61	8 (13·1%)	0	33 (43·4%)	6 (7·9%)	0 (0·0%)	18 (23·7%)
Totals	453	366	65 (17·7%)	2	180 (39·7%)	78 (17·2%)	11 (2·4%)	112 (24·7%)

TABLE II.—*Total Numbers of Lung Tumours in Mice living 10 Months or Longer*

Experiment	Length of Experiment from 1st Day of Dusting (Days)	No. of Mice		Animals with Lung Tumours					
				Control			Dusted		
		Control	Dusted	Total	Simple	Malignant	Total	Simple	Malignant
SiO_2+MeChol.	710	66	63	9	5	4	15	11	4
Steel grindings	766	52	59	4	2	2	8	4	4
$Al_2O_3+SiO_2+Fe_2O_3$	838	65	57	6	3	3	9	6	3
Czechoslovak dust (2)	870	47	64	1	1	0	13	5	8
$Al_2O_3+SiO_2+Fe_2O_3+CaCO_3$	708	60	62	0	0	0	12	5	7
Tarred road dust (2)	661	69	61	1	0	1	8	4	4
Totals	—	359	366	21 (5·8%)	11 (3·0%)	10 (2·8%)	65 (17·7%)	35 (9·5%)	30 (8·2%)

TABLE III.—*Degree of Dusting. Deposit in Lungs of Mice of All Ages*

Experiment	No. of Mice with Deposit in Lungs								No. of Mice	
	Very Slight	Slight	Slight to Moderate	Moderate	Moderate to Heavy	Heavy	Heavy to Very Heavy	Very Heavy	With Dust	Still Alive after First Clear Evidence of Deposit
Steel grindings	3	5	8	22	19	4	0	0	61	64
$(Al_2O_3+SiO_2)+Fe_2O_3$	4	12	35	10	1	0	0	0	62	62
Czechoslovak dust (2)	3	27	12	12	5	0	0	0	59	61
$(Al_2O_3+SiO_2+CaCO_3)+Fe_2O_3$	4	5	10	32	11	0	0	0	62	65
Tarred road dust (2)	6	12	20	17	9	1	0	0	65	66
$(SiO_2)+Fe_2O_3$ (1940)	2	14	24	18	1	0	0	0	59	62

TABLE IV.—*Degree of Dusting. Deposit in Tracheo-bronchial Lymph Glands of Mice of All Ages*

Experiment	No. of Mice with Deposit in Glands								No. of Mice	
	Very Slight	Slight	Slight to Moderate	Moderate	Moderate to Heavy	Heavy	Heavy to Very Heavy	Very Heavy	With Dust	Still Alive after First Clear Evidence of Deposit
Steel grindings	3	12	3	9	3	3	0	0	33	49
$(Al_2O_3+SiO_2)+Fe_2O_3$	7	21	3	1	1	0	0	0	35	45
Czechoslovak dust (2)	3	4	9	5	5	0	3	13	42	54
$(Al_2O_3+SiO_2+CaCO_3)+Fe_2O_3$	5	21	3	6	1	0	0	0	36	51
Tarred road dust (2)	2	4	1	3	11	5	4	7	37	58
$(SiO_2)+Fe_2O_3$ (1940)	5	17	1	3	1	0	0	0	27	46

TABLE V.—*Fibrotic Nodules in Tracheo-bronchial Lymph Glands, produced by Amorphous SiO_2*

Experiment	No. of Mice		No. with Fibrotic Nodules					First Evidence	
	Original	Living 10 Months or Longer	Total	Well Marked	Marked	Slight	Very Slight	Days after First Day of Dusting	Age of Mouse (Days)
SiO_2 (1940)	75	61	41	8	18	12	3	174	264
$SiO_2+Fe_2O_3$ (1940)	74	62	5	0	0	3	2	465	555
SiO_2+MeChol.	76	63	32	5	12	13	2	266	356
$SiO_2+Fe_2O_3+Al_2O_3$	75	57	18	0	2	11	5	270	360
$SiO_2+Fe_2O_3+Al_2O_3+CaCO_3$	77	62	23	0	7	7	9	273	363
Totals	377	305	119	13	39	46	21	—	—

TABLE VI.—*Lung Tumours in Mice living 23 Months or Longer*

Experiment	Control Mice				Dusted Mice			
	No.	Mice with Tumours			No.	Mice with Tumours		
		Total	Simple	Malignant		Total	Simple	Malignant
SiO_2+MeChol.	19	5	2	3	13	9	7	2
Steel grindings	17	2	1	1	8	3	1	2
$Al_2O_3+SiO_2+Fe_2O_3$	16	4	1	3	14	4	1	3
Czechoslovak dust (2)	6	0	0	0	18	7	5	2
$Al_2O_3+SiO_2+Fe_2O_3+CaCO_3$	4	0	0	0	13	3	2	1
Tarred road dust (2)	8	0	0	0	11	4	1	3
Totals	70	11 (15·7%)	4 (5·7%)	7 (10·0%)	77	30 (38·9%)	17 (22·0%)	13 (16·9%)

Obviously a very active carcinogenic agent was present, and there is no doubt about the result, since others have obtained similar great numbers of tumours by means of carcinogenic agents, sometimes used in very small quantity. In a further experiment (Campbell, 1937a) the tar was removed from the dust by benzene, yet the tar-free dust still produced an increase in incidence and in malignancy of lung tumours, although the rise in incidence was less than when the tar was also present. The inorganic constituents of the dust have been proved to be partly responsible for the increase in lung tumours, but a carcinogenic agent which the benzene failed to remove may still have been included.

The present sample of tarred road dust was obtained from the same road surface as the above sample, but about five years after the tarring had been done, whereas the former sample was obtained soon after tarring. The present sample of dust still contains about 2% of tar, but the carcinogenic agent, although still there, is not so active as in the former sample, since the dust did not produce cancer of the skin by the dusting alone. Also, when tested by the mouse skin test—that is, by bi-weekly tarring of the skin with the tar extracted from the dust by benzene—this second sample was not so powerful as the previous one, it being possible that the longer exposure on the road surface to light and air may have weakened the carcinogenic agent. The inorganic constituents of the second sample are similar to those of the previous one (Campbell, 1934, 1937a).

In the present case the dusting produced about a ninefold increase in lung tumours, there being 8 (13.1%) of the 61 dusted mice and 1 (1.4%) of the 69 control mice with tumours (Tables I and II). In the former experiment the increase was also about ninefold, but this was much more impressive than the present increase, since the figures for incidence of lung tumours in the former were 74% for the dusted mice and 8% for the controls—that is, many more of the mice had lung tumours in the former experiment.

In the present experiment the deposit of dust in the lungs of most of the dusted mice was of moderate amount (Table III), but some of the lymph glands contained very heavy deposits (Table IV), yet they showed only hyperplasia of lymph tissue (Table I) as occurs both in the lungs and in the glands of mice exposed to dust not containing carcinogenic agents.

Conclusions

Lung Tumours.—All the dusts tested herein produced some increase in incidence of primary lung tumours of mice living 10 months or longer, the Czechoslovak dust, tarred road dust, and the mixture containing alumina, silica, iron oxide, and calcium carbonate showing the greater increases. In some cases, however, the results were not so impressive as had been expected. Recently the stock of mice seems to have become more resistant to development of tumours. In the control groups of a total of 359 mice about 7% possessed tumours of any kind, and practically all these tumours were of the lung. In a previous group of 593 control mice the incidence of tumours of all kinds was about 12% (Campbell, 1940), nearly twice that of the present group, and again nearly all these tumours were in the lung. The incidence of all kinds of cancer in man is about 10%, and lung tumours, although increasing recently in numbers, are fewer than those of the alimentary and reproductive systems. It is possible that if there were inbreeding in man lung tumours might increase to a much greater extent in certain groups, as occurs with certain strains of mice. The high incidence of lung cancer in Czechoslovak mining districts may be influenced by some such factor of heredity. Radium under certain circumstances reduces tumour growth, and it is curious that this inhibitory action should not be more apparent in the human lung tumours in Czechoslovakia: radium may not be the only factor concerned.

As indicated in Tables I and II the increase in incidence of lung tumours in all the dusted groups of mice living 10 months or longer (total 366) is threefold that of the controls (total 359). A similar result is obtained if the mice living 23 months or longer (70 controls; 77 dusted) are alone considered (Table VI). In both controls and dusted mice the older mice have the higher incidence.

In all there were 86 mice with lung tumours, and 64% of these were in females and 36% in males; in man, lung tumours are more prevalent in the male. As regards colour, of the total 897 mice 295 were white, 260 fawn, and 217 chocolate; 13.9% of the white mice, 10% of the fawn, and 6.4% of the chocolate had lung tumours.

Lymph Tissue.—There was nearly a fourfold increase in the incidence of hyperplasia of lymph tissue of the lung and a threefold increase for the tracheo-bronchial lymph glands as the result of the dusting (Table I). The types of cells concerned in this reticulosis were sometimes the lymphocytes chiefly and sometimes the reticulum cells, and again sometimes both more or less equally. In previous dusting experiments a similar and expected reticulosis was observed (Campbell, 1940). Normally the tracheo-bronchial lymph nodes of the mouse are about two in number and about 1 to 2 mm. in diameter. Hyperplasia was considered to be present if this diameter was increased to 3 mm. or more. Sometimes the increase was very marked. Reticulosis of other organs ("General," Table I) was not affected by the dusting.

Pneumonias.—With the exception of Control Group VI (Table I), the dusted mice revealed a much higher incidence of pneumonia and bronchopneumonia taken together than did the control mice.

Silicotic Nodules.—So far as I know, the production of silicotic nodules by an amorphous silica, not containing the crystal unit of quartz, has not been demonstrated in any other laboratory; the present results for the tracheo-bronchial lymph glands confirm the original findings (Campbell, 1940, 1941). All the results (including those of 1940) obtained with this silica are recorded in Table V. Silicotic nodules were not produced in the lungs themselves, probably because most of the silica had been removed from the lungs, the degree of dusting not being heavy enough to affect them also. An experiment with much heavier dusting is now being conducted. As expected, the experiments (Table V) with silica alone and with silica plus the very small quantity of methylcholanthrene produced the greatest numbers and most pronounced fibrotic nodules in the lymph glands. The first nodules must have appeared in less than six months. In the other three experiments the silica was diluted by other dusts, so that the effect was not so obvious. In the experiment with silica plus iron oxide the result was less marked than expected, and it is possible that the iron oxide inhibited the development of silicosis, since some other, but not all, observers report a similar inhibitory action for iron oxide (Naeslund, 1940). It would appear that, taking account of the dilution of the silica, neither alumina nor calcium carbonate exerted any active inhibition of silicosis in the lymph glands of mice under the existing conditions. The crucial experiment with aluminium and silica only is now being conducted. The original discovery by Canadian workers (Denny *et al.*, 1937) of such an inhibitory action of aluminium in the case of silicosis of the rabbit's lung has been confirmed (Naeslund, 1940).

Summary

All six dusts or mixtures of dusts tested herein increased the incidence of primary lung tumours in mice: in all experiments taken together the increase in mice living ten months or

longer was threefold that for controls. Certain of the increases were not so impressive as expected. Some of these dusts (Czechoslovak, tarred road, silica, iron oxide) are under suspicion as causes of lung tumours in man.

Heredity, age, the so-called carcinogenic agents, and some dusts are definite factors in the experimental development of lung tumours in mice. Efforts to inhibit lung tumours with alumina or calcium carbonate were unsuccessful.

The dusts produced about a fourfold increase in the incidence of hyperplasia of lymph tissue in the lungs and a threefold increase for tracheo-bronchial lymph glands. There was also an increase in most experiments in the incidence of the pneumonias.

Silicotic nodules were produced in the tracheo-bronchial lymph glands of mice breathing an amorphous silica; this confirms the first (Campbell, 1940, 1941) demonstration of silicosis produced without the crystal unit of quartz.

I am indebted to Prof. J. Löwy for the active sample of Czechoslovak dust; to my colleague Dr. H. King's department for some advice and help with certain of the analyses; to Mr. C. Pergande for technical assistance in this research; and to Mr. F. J. Higginson for cutting and staining the sections.

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ISOLATED FRACTURE OF THE CARPAL CUNEIFORM

BY

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During the past two years 580 cases of injuries to the wrist have been seen at this hospital, and 20 of these have been fractures of the carpal cuneiform. The condition has been referred to by Kellogg Speed (1925), and an article by F. Deneke (1911) included the bibliography up to that date. The latter author described 3 cases, in each of which there was a fracture of the styloid process of the ulna.

Aetiology.—The condition arises as a result of a fall on the outstretched hand. Of the 20 cases seen at this hospital none was due to direct injury, and 3 had an associated fracture of the lower end of the radius. The observations by previous writers, including Kellogg Speed, that isolated fracture of the cuneiform is a rare condition do not, therefore, appear to be accurate.

Physical Signs.—The patient complains of pain over the ulnar aspect of the dorsum of the wrist. All movements are painful, particularly ulnar deviation. There is always considerable swelling, and a localized point of tenderness can be felt directly over the cuneiform.

X-ray Appearances.—No abnormality will be present in the antero-posterior view unless there is an associated fracture of the proximal row of carpal bones or of the lower end of the radius or ulna. In the lateral view three clearly defined types of fracture may be recognized: (1) an area extending through two-thirds of the cuneiform at its dorsal aspect, with radiating cracks or fissures through the bone: (2) a small flake of bone avulsed from the dorsum with considerable separation; and (3) a small flake fracture with no separation.

Pathology.—In those cases in which the injury was sustained by a fall on the palm of the outstretched hand a fairly large area of the dorsum of the cuneiform was fractured, for in the dorsiflexed position the cuneiform is compressed between the pisiform and the lower end of the ulna, giving rise to a typical fracture extending through the bone. Radiographs taken in dorsiflexion show the situation of these bones in relation one to another (Fig. 1). The force may, however, be so applied that the cuneiform is momentarily dislocated backwards, and the strong ligaments passing between it and the semilunar avulse a flake of bone without an associated compression fracture. Case 2 illustrates this point. A radiograph showed not only a small flake fracture of the cuneiform but also a posterior marginal fracture of the lower end of the radius, a condition caused only by a fall on the outstretched palm. This patient located the tenderness not on the ulnar collateral ligament but between the cuneiform and the semilunar. When, however, the patient falls on to the back of the hand, only small flake fractures of the cuneiform are seen in the

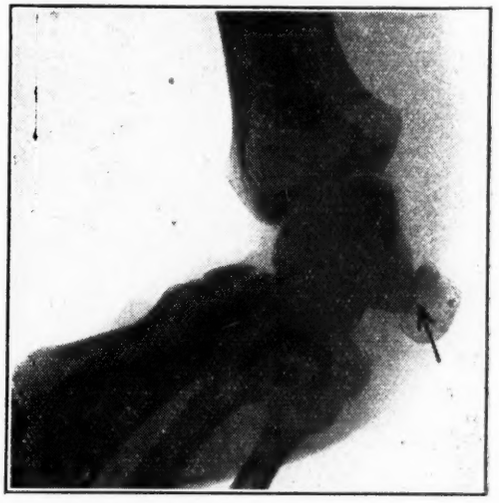

FIG. 1.—Radiograph showing wrist in dorsiflexion. It will be seen that a fall on the wrist in that position compresses the cuneiform between the pisiform and the lower end of the ulna.

radiograph. When the wrist is violently plantar-flexed the ulnar collateral ligament is strained, and either a flake of bone is removed from the cuneiform or the ligament itself is torn. It has been observed, also, that a fracture of the cuneiform always accompanies a perilunar dislocation of the carpus, where all the bones of the wrist, with the exception of the semilunar, are dislocated backwards and outwards, and as a result flakes of bone are torn from the cuneiform by the ligaments which bind it to the semilunar. Wittek (according to Deneke) himself fell on his outstretched hand and sustained a fracture of the cuneiform. The condition was not diagnosed at the time, and he suffered considerable disability lasting for more than a year.

Treatment.—Immobilization in plaster-of-Paris for three weeks is followed by no recurrence of the symptoms, and union takes place rapidly.

Illustrative Cases

Case 1.—The patient, a housewife aged 65, fell in the street on to the palm of her hand. On admission to hospital there

was swelling of the dorsum of the wrist, all movements being painful, but particularly ulnar deviation when the wrist was dorsiflexed. A radiograph showed a fracture of the cuneiform involving two-thirds of the bone (Fig. 2).

FIG. 2.—Case 1. Showing fracture of the cuneiform involving two-thirds of the bone.

Case 2.—The patient, a housewife aged 51, slipped and fell on to her left wrist. On admission to hospital she complained of pain in the wrist, and there was a point of maximal tenderness between the cuneiform and the semilunar. A radiograph showed a small flake fracture of the dorsum of the cuneiform and a posterior marginal fracture of the lower end of the radius (Fig. 3).

Case 3.—The patient, a man aged 31, fell 20 feet from a roof. On admission to hospital he did not remember anything about the accident. He sustained a fracture of the transverse process of the second, third, and fourth lumbar vertebrae and a flake fracture, with considerable separation, of the dorsum of the left cuneiform (Figs. 4 and 5). There were physical signs similar to those described in the two preceding cases.

FIG. 3.—Case 2. Showing small flake fracture of the cuneiform and a posterior marginal fracture of the lower end of the radius.

FIG. 4.

FIG. 5.

FIGS. 4 and 5.—Case 3. Showing flake fracture of cuneiform with considerable separation of fragment.

Summary

Three cases of isolated fracture of the carpal cuneiform have been described.

Seventeen cases of isolated fracture of the cuneiform and 3 cases associated with fracture of the lower end of the radius have been seen at this hospital in the past two years. These observations are not in accordance with those previously described.

The condition may be easily overlooked: no evidence of fracture will be seen in any of the antero-posterior views described, and unless the fracture is recognized from the lateral radiograph considerable disability follows failure to immobilize the wrist in plaster-of-Paris.

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Medical Memoranda

Bacteriological Standards in the Investigation of Enteric Convalescents

Although there has been a decided decrease in the incidence of enteric fever during the last fifty years, isolated cases continue to occur and even large outbreaks are occasionally reported. Since unsuspected carriers are often responsible for the dissemination of infection, it would be desirable to institute a more searching bacteriological examination of enteric convalescents than is in vogue in most hospitals. The inadequacy of the common practice of assuming that a patient is free from infection following negative results from cultures of three specimens of both stool and urine obtained at weekly intervals is demonstrated in the history of the following case.

CASE REPORT

The patient, a youth aged 18, was taken ill on June 19, 1939, with malaise and sore throat, and at the end of a week he developed diarrhoea and complained of generalized aches. He was admitted to hospital on June 27 as a suspected case of typhoid fever. On examination the face was flushed, the tongue lightly furred, and a few rose-coloured spots were present on the trunk. The abdomen was soft, and on deep inspiration the edge of the spleen could be palpated. The temperature was 102° and the pulse 120. The stools were loose but of normal colour. A Widal test performed on the day after admission showed agglutination of a suspension of *B. typhosus* in a 1 in 50 dilution. On the following day a repetition of the test yielded a rise in the titre to 1 in 250, thus confirming the diagnosis. During the ensuing two weeks the patient remained very ill, with a temperature varying from 99° to 102°, and complained of occasional attacks of pain in the right hypochondrium. At these times there was also tenderness on pressure and slight rigidity of the musculature in that region. Three weeks from the onset of symptoms the pulse rate and temperature returned to normal, but convalescence was interrupted by a period of irregular pyrexia which lasted for five days. Slight tenderness over the gall-bladder was the only sign present at this stage. Subsequently improvement was rapid. Specimens of faeces and urine were cultured at weekly intervals and proved negative on three consecutive occasions. Wilson and Blair's selective medium was used. Following these results he was discharged from hospital on August 21, 1939.

The patient remained well for the next eight months, but on April 24, 1940, he was seized with severe pain in the right upper part of the abdomen, relieved by vomiting ten minutes afterwards. A similar attack occurred two days later. He consulted his family doctor, who suspected typhoid cholecystitis, and thereupon ordered a bacteriological investigation. *B. typhosus* was cultured from the bile but not from the faeces, and the Vi agglutination test was negative. On his identification as a carrier he was readmitted to hospital on May 6, 1940, where routine bacteriological examinations of the faeces yielded positive results. Courses of various drugs, including sulphapyridine, hexamine, and sulphathiazole in full therapeutic doses, were administered, but positive faecal cultures were still obtained. With the failure of medical treatment an operation for the removal of the gall-bladder was advised. This measure was successfully undertaken on August 15. The pathologist's report stated that the gall-bladder was normal in size, showed chronic inflammatory changes, and contained numerous small black calculi. Colonies of *B. typhosus* were isolated on plates inoculated with the scrapings of submucosa.

From the specimens of faeces examined at weekly intervals after cholecystectomy three consecutive negative results were obtained. The patient was sent home on September 12 with instructions to forward samples of stool for examination at monthly intervals for six months. In addition, on November 20, 1940, and February 14, 1941, a few cubic centimetres of duodenal contents were aspirated and cultured. As the results of all these tests were negative it was concluded that the carrier state had been terminated.

COMMENTARY

The importance of this case lies in the fact that a carrier of *B. typhosus* was discharged from hospital, following an attack of typhoid fever, and declared to be free from infection after the usual measures to determine such freedom had been carried out. From the history it would seem that during the course of the fever there occurred some degree of cholecystitis, which later became chronic and resulted in the formation of calculi. This residual focus of infection proved to be the source of the typhoid bacilli which were cultured from the bile and faeces several months later. Intermittency in the excretion of typhoid organisms in the stools of biliary carriers is a well-recognized phenomenon and explains the negative results obtained from cultures of the excreta during the patient's convalescence from the acute disease.

In an investigation of 136 patients convalescent from typhoid fever Garbat (1922) cultured *B. typhosus* from the bile in 20 cases after three consecutive specimens of faeces taken at six-day intervals had been reported negative. The same author expressed the opinion that the only reliable indication of the absence of typhoid organisms from the excreta depends upon obtaining two consecutive negative bile cultures, two consecutive negative stool cultures, and a negative culture in broth from a twenty-four-hour specimen of urine collected with aseptic precautions. The adoption of this criterion of freedom from infection following typhoid and paratyphoid fevers would ensure that no convalescent who continues to excrete the organisms would be discharged from hospital with a clean bill of health and allowed to mix freely with the community.

The Vi agglutination test, which is reported to give a positive result in a high proportion of carriers of *B. typhosus* (Felix, 1938), was negative in the above case and gave no indication of the persistence of infection. The patient was much younger than the usual carrier, whose average age corresponds to that of the sufferer from cholecystitis—i.e., over 40. That, so far as is known, he did not give rise to any case of the disease while in the carrier state was accounted for by the cleanliness he was accustomed to observe in his personal habits.

I am indebted to Dr. Thomas Orr, medical officer of health, for permission to publish this case, and to Dr. A. B. Porteous for carrying out all the bacteriological investigations.

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Facial Prostheses

The establishment of a number of maxillo-facial units throughout the country at the beginning of the present war indicated that the authorities fully expected a considerable amount of work involving plastic reconstruction. It seemed worth while, therefore, to investigate the question of facial prostheses, if only as a temporary means of early rehabilitation of patients who might otherwise have to wait long periods for the later stages of treatment.

A critical assessment of the earlier methods employed—namely, aluminium, gelatin-glycerin mixtures, plastics, and vulcanite—showed them to be inferior to vulcanized latex. During the past two years I have elaborated a technique for using vulcanized latex. The aesthetic standard attained is regarded as high (see accompanying photographs). As the

Photographs showing patients before and after application of prostheses.

material is essentially soft rubber, it slowly perishes under the influence of light and grease. However, its relative permanence compared, for instance, with gelatin-glycerin mixtures renders it more acceptable to patients.

The commonest types of case dealt with were those requiring prosthetic restoration of lost nasal tissues following upon lupus or rodent ulcer. Patients from the Christie Hospital and Holt Radium Institute and from the Manchester Royal Infirmary have been treated for loss of nose, ear, orbit, or part of the lips. The anatomical correctness attained by this method cannot be easily approached by the plastic surgeon; particularly is this true of the ears.

The prostheses, which are hollow and of minimal weight, are readily attached with a suitable adhesive substance and well tolerated by the patient. It is considered that this technique might well be applied to facial war injuries.

I am indebted to Dr. W. J. Naunton and Dr. C. Falconer Flint of Imperial Chemical Industries Ltd. for their helpful criticism.

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Reviews

DISEASES OF THE EYE, EAR, NOSE, AND THROAT

The 1941 Year Book of the Eye, Ear, Nose, and Throat. The Eye, by Louis Bothman, M.D.; the Ear, Nose, and Throat, by Samuel J. Crowe, M.D., with the collaboration of Elmer W. Hagens, M.D. (Pp. 648. 16s. 6d.) Chicago: The Year Book Publishers; London: H. K. Lewis and Co., Ltd.

This yearbook lacks nothing of its established standard of excellence and is particularly welcome in times when the international exchange of professional literature has become both precarious and limited, so that access to original articles is often difficult. It appears, in fact, that the edition for 1940 itself did not reach London. Original features of the 1941 edition are two special articles at the beginning of the respective divisions of Eye and Ear. Dr. Bothman himself writes on clinical manifestations of allergy in ophthalmology, and gives an exhaustive survey of this difficult subject. His erudition leads him to refer to a vast and rather overwhelming number of writers in a comparatively short article, but it is packed with information. Dr. Crowe has entrusted the other special article, on aviation medicine, to Major Paul Campbell of the School of Aviation Medicine at Randolph Field, Texas. This article of about thirty-five pages, which begins with a short historical review, is the outstanding feature of the present volume and of supreme interest at the moment. Some idea of its importance may be inferred from the following two sentences which relate to the war of 1914-18. "Analysis of Great Britain's casualty list of the first year of combat disclosed the astounding fact that of each 100 fliers killed, two had met death at the hands of the enemy, eight from plane defect, and ninety from the deficiency of the individual. Of those ninety fatalities, sixty were due to physical defect." There are also many abstracts of articles of much interest in the fields of ophthalmology and oto-laryngology. One in particular may be mentioned, "Observations on use of gramicidin (Dubos) in treatment of streptococcic and staphylococcic infections," because not much has been heard about it in Great Britain.

A SURGICAL SYMPOSIUM

Guy's Hospital Reports. Special Number. Dedicated to Sir Astley Paston Cooper, Bt., F.R.S., Surgeon to Guy's Hospital, 1800-25. Vol. 90 (Vol. 20, Fourth Series). Nos. 2, 3, and 4. 1940-1. Edited by R. C. Brock, M.S., F.R.C.S. (Pp. 298. Issued quarterly; single numbers, 10s. net; annual subscription 30s. net, post free.) Published at Guy's Hospital, London; obtainable also from Headley Brothers, 109, Kingsway, W.C.2.

When there is a shortage of paper the publication of hospital reports, which may be regarded as something of a luxury, can rarely be justified; this special number of the *Guy's Hospital Reports* is clearly one of the rare exceptions to the ban which the war has imposed. It had to appear in 1941 to commemorate the centenary of the death of Sir Astley Cooper, but its contents are of sufficient merit in themselves to remove any lingering doubts about the propriety of publishing under the present conditions.

The volume opens with an appreciation of Sir Astley Cooper as student, anatomist, surgeon, and teacher, written by Sir Charters Symonds, and first published in the *Reports* in 1922. The essay gives a fine portrait of the man, and taken as a whole it is so good that we must be pardoned for finding fault with a matter of detail—it was Sir Everard Home who was Serjeant Surgeon to George IV, and whose instruments Cooper borrowed to operate on the King. Then follows a paper by R. C. Brock on Astley Cooper's interest in arterial surgery. This gives the keynote to the whole volume, and we cannot help wondering what sort of impression the various contributions would have made upon the great man himself—no doubt he would have been enthralled, and probably amazed, and possibly a little incredulous—for they include some very remarkable clinical records.

Prof. Ryle writes on arteriovenous fistula, introducing an interesting reference to John Keats as a student attending Cooper's lectures on surgery. There is a stimulating paper by R. Davies Colley, who sets forth the evidence for regarding cirsoid aneurysm as a development from a pre-existing cavernous angioma; and Nils Eckhoff describes the difficulties which had to be overcome before success was achieved in the treatment of a cirsoid aneurysm of the chest wall. D W. C. Northfield contributes an article on angiomatous malformations of the brain; L. Bromley on resection and anastomosis of the external iliac artery during the excision of a seminoma of an undescended testis; and E. G. Slesinger on an obscure case of painful oedema of all four limbs relieved by sympathetic ganglionectomy. There are four papers on aneurysms—of the vertebral artery by W. H. Ogilvie; of the innominate artery by R. C. Brock; and two of the popliteal artery, by A. G. Hardy and H. E. H. Denham, and by H. R. Harley.

Vascular injuries are dealt with by Keith Simpson, who describes some instances of traction rupture of the great vessels of the chest following injury to the head; and by Sol. M. Cohen, who gives an excellent account of traumatic arterial spasm. A paper by J. E. Spalding on periarteritis nodosa, and two by Brock on ligation of the pulmonary artery and on brachial artery embolectomy, complete a volume which is profusely illustrated, and produced in pre-war style.

REFORM OF WORKMEN'S COMPENSATION

Workmen's Compensation. Vol. 2: Need for Reform. By Sir Arnold Wilson, M.P., and Prof. Hermann Levy. (Pp. 383. 18s. net.) London: Oxford University Press. 1941.

Sociology suffered a grievous blow when Sir Arnold Wilson was reported missing from an air attack on enemy territory in the spring of 1940. His research into little-known and thorny social problems, and his labour for their solution by writing and speeches in Parliament and outside, entitle him to recognition as a British social reformer. Luckily, however, he was able before his disappearance to finish the great monograph which he had long been compiling with Professor Levy, and actually read the first hundred pages of the proofs in the intervals of his military duties. This second volume, which has been eagerly awaited, will not disappoint the lively expectations which were aroused by the appearance in 1939 of the first volume,[1] which dealt with the social and political development of workmen's compensation. Many will consider the new volume, on the need for reform, more interesting, dealing as it does with the vital problems of the present and future. It is distinguished by the thoroughness of investigation and the clarity and impartiality of presentation which made the first volume so outstanding a success.

As might be expected, the authors have little if anything good to say about the present system—to use a charitable word—of workmen's compensation in Great Britain. Ours is the only considerable industrial country which makes no attempt to link up compensation with medical treatment. One reason, as they point out, is, of course, that workmen's compensation was introduced many years before National Health Insurance. The N.H.I. scheme partly fills

[1] *British Medical Journal*, 1939, 1, 1184.

the great gap but is terribly chaotic in practice. The authors set out four possibilities of treatment of an injured workman, none of which is practicable under the present system. He can be treated at home by his panel doctor, or in a hospital, or by a doctor instructed by the employer or insurance company, or under some official or semi-official administration. Home treatment is the most common and the least successful. They declare that insurance companies should be directly concerned to promote the recovery and rehabilitation of the injured worker; at present their indifference is a serious evil. Moreover, continuity and uniformity of treatment could be better provided if the medical administration of treatment lay with the compensation authority.

The keynote of the whole volume, with its amazing width of scope and appreciation of detail, is the demand that medical treatment should be made an integral part of workmen's compensation. The evidence the authors produce, from uncountable sources, seems irrefutable. The book will be an indispensable weapon to every reformer until its objects have been secured.

CROSS-SECTION ANATOMY

Manual of Human Cross-Section Anatomy. By Dudley J. Morton, M.D., Raymond C. Truex, M.S., Ph.D., and Carl E. Kellner. (Pp. 250; 90 cross-sections. 33s.) Baltimore: The Williams and Wilkins Company; London: Baillière, Tindall and Cox. 1941.

This book by Morton, Truex, and Kellner of Columbia University is a handsome atlas consisting of a series of plates representing ninety sections of the head, trunk, and limbs, with sixteen key-figures showing the different levels of the sections, and supplemented by tables giving the names of the various parts seen in each section. The technique adopted for the drawings is a semi-diagrammatic and simplified representation of the various tissues and organs, so that bone, muscle, tendon, fatty or connective tissue, and glands are readily distinguishable, and in many places the spaces which are occupied by vessels and nerves have been left to be filled in with ink or colour, and numbered in accordance with the tables giving the names and reference numbers. The authors suggest that the atlas may be used in combination with a series of coloured lantern slides, which have been prepared from the same sections, so as to supplement the work done by individual students in identifying the various parts represented in the drawings of the sections. Blank pages for notes are provided in the book for this purpose.

Great care has been taken in preparing the sections and drawings and in the correct identification of all the principal parts visible in each section, and the atlas will not only be of use as a means of learning topographical anatomy from a standpoint which differs from the usual approach by dissection, but it will also prove to be a reliable guide for general and specialized medical practitioners, and it is of distinct general scientific value. There is little to criticize in a work of such outstanding merit, but it may be worth mentioning that where, owing to the thickness of the sections, an important structure such as the vermiform appendix does not appear in the plane traversed by the section, a very slight dissection will often bring the part into view, and greatly add to the practical value of the specimen. The dissection may have to be done on either the upper or lower surface of the slab, and this should be noted in the record. Sections viewed from below are often those which would be encountered in practice—that is, in a circular amputation of a limb—and it is a good training when examining actual specimens to inspect them from both sides.

Notes on Books

Mr. GEORGE W. GRAY'S book, *The Advancing Front of Medicine* (McGraw-Hill Book Company, 15s.) is written on popular lines. He was trained as a journalist, and here is good journalism. Like most lay writers, he tends to be too optimistic; the professional man sees not only the "high spots" of sensational successes but also the unrecorded disappointing failures, and he reflects sadly on Trousseau's sardonic advice to use the new remedies while they still have power to heal. Nevertheless, Mr. Gray has conned his brief well and presents it attractively; there are few medical men who would not find fresh interest in these pages.

The new textbook of *Experimental Physical Chemistry*, by W. G. PALMER, Sc.D., is an excellent form of introduction to the study of the subject (Cambridge University Press, 12s. 6d.). It describes a series of experiments which do not require more than ordinary laboratory equipment and which are well chosen for demonstration of the more important fundamental principles. The approach to these principles may be made more effective by way of the laboratory than of the lecture room, and the author has supplied every requisite to attain that object. The theoretical treatment is adequate and free from ambiguity. The instructions are made clear by sketches, diagrams, and working examples.

Preparations and Appliances

"LIQUID PLASTER" FOR IMMOBILIZATION

Dr. S. GALEWSKI, resident surgical officer at the French Hospital, London, writes:

The ancient method of using plaster to immobilize injured members presents certain disadvantages, of which the most important is its weight. This weight is especially cumbersome for patients with walking plasters, which need too great a muscular effort, or for arm splints, which usually require a support. For some time now I have been using a solution of silicate, prepared for me by the A. and H. Laboratories, which in some cases is much superior to the plaster. It is a non-inflammable liquid which when applied in the following manner forms a dressing just as strong as the plaster, but its weight is approximately ten times less.

Technique.—A jersey is applied to the injured limb; or, if there are contusions on the skin, Unna's paste is used. Shaving is not necessary. Then the whole limb is enveloped in grease-proof paper without paying attention to the folds. On both ends a piece of felt about 2 cm. long is applied, the ends of the felt fitting exactly with no overlapping, and fixed by leukoplast. Loosely rolled gauze bandages are soaked in this liquid for seven to ten minutes, and wound round the limb. Usually four layers are sufficient. I finish off with dry ordinary gauze bandage.

The dressing is very soft but hardens on drying, and after twenty to twenty-four hours it is so hard that the patient can walk on it with confidence. The liquid plaster is especially recommended for walking apparatus, temporary orthopaedic apparatus, and for certain fractures or luxations of the finger. The abnormal war conditions often prevent the surgeon from having at its disposal orthopaedic apparatus; and, as modelling with liquid plaster is very easy, the plaster can be used with success for this purpose.

The advantages of using this solution for certain fractures or luxations of the finger are: (1) the ease with which the bandage is wound round the fingers; (2) the modelling without difficulties; (3) the firm fitting of the dressing to the fingers. The only disadvantage appears to be the length of time needed for drying, but this may be shortened considerably by the use of hot air, radiant heat, etc. Liquid plaster may also be prepared in inflammable solution, which greatly shortens the time necessary for drying, but the disadvantage of this, especially in wartime, is obvious.

I should like to express my thanks to Allen and Hanburys Laboratories for preparing this solution.

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FRAGILITY AND VIABILITY OF THE RED CELLS

Until recently the fragility of the red blood cells was synonymous with their resistance to hypotonic saline solution, which is diminished in acholuric family jaundice, as Chauffard discovered a generation ago. Accurate determination of the saline resistance is more difficult than is often appreciated, and tests to-day are based on the work of Creed[1] and of Dacie and Janet Vaughan,[2] who showed that such factors as strength of the solutions, O_2 and CO_2 content of the blood, degree of anaemia, and temperature of the reactions must be standardized. The results are expressed either as a curve, which can be compared with the normal range, showing the percentage of haemolysis at various NaCl concentrations, or as the mean corpuscular fragility (M.C.F.), which is the NaCl concentration at which 50% of the red cells are haemolysed. Careful work of this kind has shown that the resistance of the red cells to hypotonic saline is very closely correlated with the degree of spherocytosis, which can be independently estimated by comparison of the mean corpuscular thickness and the mean corpuscular diameter (T/D ratio). In other words, the more spherical the cells the sooner they rupture under the influence of osmosis.

Fahraeus[3] discovered that the red blood cells become more spherical on storage at body temperature, and it is now known that their volume increases and their resistance to hypotonic saline diminishes. Fahraeus suggested that the changes were due to the action of lysolecithin, a haemolytic derivative of lecithin which is formed in stagnant blood. Strong concentrations of lysolecithin haemolyse the red cells completely. This discovery has led to work in several different directions. Singer[4] devised a method for estimating the resistance of the red cells to lysolecithin. The spherocytes of acholuric family jaundice are much less resistant to lysolecithin than normal erythrocytes, but in the spherocytosis which is occasionally found in acquired haemolytic and other anaemias resistance to lysolecithin is normal. The lack of parallelism in the resistance of various types of erythrocytes to lysolecithin and to hypotonic salt solution indicates that the mechanism of haemolysis by these haemolytic agents is a different one. As a result of subsequent studies Singer[5] thought it unlikely that lysolecithin was the agent responsible for the increased blood destruction in acholuric family jaundice.

Dacie[6] has shown that when normal blood is stored at 37° C. only a trace of haemolysis is present at twenty-four hours, whereas when blood from cases of acholuric family jaundice is stored haemolysis can sometimes be seen at five hours and is often well advanced after twenty-four hours' incubation. He suggests that this may be due to an increased absorption of lysolecithin *in vivo*, so that the cells are more sensitive to the lysolecithin formed *in vitro*. Lloyd,[7] who has confirmed the diminished resistance to storage of the red blood cells in acholuric family jaundice, has shown that lysolecithin does not appear to play much part in haemolysing stored blood, nor can such a concentration of this substance be produced by incubation of serum as will of itself cause haemolysis either of normal cells or of those of acholuric family jaundice. Changes take place in red cells stored *in vitro* under conditions which completely prevent the production of lysolecithin, such as free movement, heating of the serum, or inhibition of ferment action. Resistance to the necrobiotic changes in the red cells which occur on storage must therefore be different from resistance to haemolysis by lysolecithin. Ham and Castle[8] appear to have dealt the final death blow to the theory that the increased fragility of red blood cells stored *in vitro* is due to lysolecithin. They point out that haemolysins such as saponin and immune serum, and presumably lysolecithin, do not produce an increase in erythrocyte volume or in fragility when used *in vitro* at concentrations causing definite haemolysis. In addition to making observations which in all particulars confirm Lloyd's, they show that only slight changes in fragility occur if the red cells are resuspended in fresh serum every two hours, and the cells can be restored almost to normal if they are equilibrated with fresh serum and oxygen at the end of twenty-four hours. They conclude that the increase of erythrocyte volume and fragility during incubation is due to metabolic processes which increase the osmotically active constituents of the erythrocytes. This is in harmony with the work of Maizels and Paterson,[9] who showed that during storage the red cells lose potassium and take up a great excess of sodium, but within twenty-four hours of transfusion the chemistry of stored cells is restored to normal. One other factor which comes into play during the storage of blood is the effect of light on the red cells, which haemolyse more rapidly in light than in darkness.[10]

Although observations on the viability of the red cells outside the body, and their resistance to shaking, osmosis, lysolecithin, and light, are of considerable value in improving the storage of blood for transfusion, they tell us little about the conditions under which red cells are broken down in the body, and they may indeed be misleading. This kind of information is better obtained by marking red cells so that they can be identified in the body and by observing their fate after transfusion. This can be done by Ashby's method of transfusing Group O erythrocytes into Group A or B recipients. The A or B cells can then be removed by *alpha* or *beta* serum and the free (O) cells counted. The M and N groupings can be used for the same purpose, but potent sera for them are more difficult to come by. A sym-

[1] *J. Path. Bact.*, 1938, **46**, 331.
[2] Ibid., 1938, **46**, 341.
[3] *Lancet*, 1939, **2**, 630.
[4] *Amer. J. med. Sci.*, 1940, **199**, 466.
[5] *J. clin. Invest.*, 1941, **20**, 153.
[6] *J. Path. Bact.*, 1941, **52**, 331.
[7] *On the Aetiology of Acholuric Family Jaundice*. By T. W. Lloyd. Thesis for Oxford D.M., 1940.
[8] *Proc. Amer. philosoph. Soc.*, 1940, **82**, 411.
[9] *Lancet*, 1940, **2**, 417.
[10] *J. Physiol.*, 1941, **99**, 510.

posium[11] by workers using this technique was published a year ago, and more recently Mollison and Young[12] have compared different methods of storage and shown that the time of survival of red cells stored in citrate-saline-glucose is little inferior to that of fresh blood. Lloyd[7] used quite a different technique to study the viability of red cells from cases of acholuric family jaundice. He transfused these cells, which are characterized by their small diameter, into normal patients of the same group. Price-Jones curves were constructed and decomposed by the method of Mogensen, whereby the normal recipients' cells could be distinguished from the small acholuric donor cells. The latter were rapidly destroyed, and the liability to premature destruction was the same whether the donor's spleen had been excised or not. Lloyd's method is more time-consuming and more open to criticism than Ashby's. It is curious that it has needed the stimulus of another great war to arouse interest in the latter technique, but it is now being actively exploited in the study of anaemia.

VITAMIN C REQUIREMENTS OF MAN

Evidence is steadily accumulating that man can be perfectly healthy even when his tissues are not saturated with vitamin C. Minot and his co-workers[13] have determined the ascorbic acid content of the blood serum of more than 500 children attending a clinic in Nashville, Tennessee, and have confirmed the finding of other investigators that if there is 0.7 mg. or more per 100 c.cm. of serum the nutritional state in respect of vitamin C is satisfactory. Values of 0.3 mg. to 0.7 mg. per 100 c.cm. indicate a restricted intake and may or may not be associated with any serious under-saturation of the tissues, whereas values under 0.3 mg. per 100 c.cm. indicate a serious deficiency. Of 533 children selected as suitable for a nutritional survey, 380 had no serious sickness or disease, 105 were sick children without diarrhoea, and 48 were sick with diarrhoea as the chief complaint. It was found that 50% of the children without serious disease had low values of ascorbic acid in the serum, the younger ones more often than the older ones; more children with high values were found in summer than in winter. Of the entire group of "normal" children about 35% during the winter and 20% during the summer had ascorbic acid values indicative of a serious deficiency of vitamin C. Of the sick children, both with and without diarrhoea, a much larger percentage had low ascorbic acid values, and again this was found more often among the younger children. Failure to eat and limitation of diet may account for the deficiency in the sick children. Minot has no explanation to offer for the absence of clinical symptoms of scurvy in the children with very low concentrations of vitamin C in the serum. He suggests that the vague symptoms—"lack of energy, loss of appetite, mental apathy, and generally retarded development"—may be due to the absence of many factors, and that the children's inactivity may prevent the development of gross symptoms of scurvy. Certainly it has often been observed that the most serious manifestations of scurvy have been seen in sailors and explorers—men who lead very active lives and are exposed to all extremes of climate and temperature. Whatever the mechanism of the deficiency may be, it seems desirable to provide extra vitamin C for sick children, whether 0.7 mg. ascorbic acid per 100 c.cm. of serum be accepted as the normal concentration or not.

Difs[14] has found no correlation between the ascorbic acid content of the blood and the number of petechiae noted in the capillary resistance test. He also has often obtained different values for determinations on the right and left arms of the same person at the same time, and on the same arm at different times. There was no correlation either between any of these determinations and the degree of unsaturation of the tissues, but there was a rough correlation between the ascorbic acid content of the blood and the degree of unsaturation. Difs finds it difficult to believe that unsaturation of the tissues denotes the presence of a deficiency disease, and contends that not by one determination but only by a series which shows progressive unsaturation can an increased consumption of vitamin C during illness be demonstrated. This conclusion was also reached by Holmes and his co-workers.[15]

Fox and his co-workers[16] have compared 950 Witwatersrand mine labourers given an additional daily ration of 40 mg. of ascorbic acid with 950 similar labourers who received only their ordinary diet, which was estimated to contain about 25 mg. of vitamin C. The plasma ascorbic acid values of all the men were extremely low, the average being about 0.24 mg. per 100 c.cm. of blood, and the values were not raised significantly by giving extra ascorbic acid. Twelve cases of scurvy occurred in the untreated group and one mild case in the group receiving vitamin C. The average ascorbic acid content of the serum of these cases was about 0.17 mg. per 100 c.cm. of blood. Apart from the scurvy cases both the treated and untreated men maintained a high level of general health, and the weight changes of the two groups were almost identical. Though vitamin C was not given after a patient entered a hospital, there was no indication that the previous giving of vitamin C had any effect on the rate of recovery from disease or that the rate of healing of wounds or fractures was accelerated. On the other hand, Lund and his co-workers[17 18] have obtained fresh evidence of the beneficial effects of vitamin C therapy on wound healing. It is based partly on work with surgical cases in hospital and, perhaps more convincingly, on the results of an experiment on one of the authors. After he had been three months on a scurvy-producing diet, a 2.5-inch experimental wound was made down through the deep fascia of the lumbar region and a specimen was secured for biopsy after eleven days. No defect in wound-healing could be demonstrated on pathological examination. After a further three months on the restricted diet a second incision was made on the opposite side. Much difficulty was found in suturing it satisfactorily. It seemed to heal by first intention, and on the tenth day it was carefully reopened for biopsy. The tissues under

[11] *Lancet*, 1940, **2**, 414.
[12] *Quart. J. exp. Physiol.*, 1941, **30**, 313.
[13] *J. Pediat.*, 1940, **16**, 717.
[14] *Acta med. scand.*, 1940, Suppl. 110.
[15] *J. Pediat.*, 1941, **18**, 300.
[16] *British Medical Journal*, 1940, **2**, 143.
[17] *J. Amer. med. Ass.*, 1941, **116**, 663.
[18] *New Engl. J. Med.*, 1940, **223**, 353.

the skin had not healed at all and the wound contained a dry, firm clot of blood. This was cleaned out and the wound resutured. The patient had a daily intravenous injection of 1 gramme of ascorbic acid for ten days, and the wound was then found to have healed normally. Hartzell and his co-workers[19] have confirmed earlier workers in finding that both the ascorbic acid and the serum protein of the blood plasma ought to be brought to and kept at the normal concentration if normal healing is to be secured.

Sweany and his co-workers[20] have estimated the total amount of vitamin C in the saturated human body as 5 mg. per 100 grammes of total body tissue—that is, from 3 to 5 grammes in the whole body. Without supplementary administration of vitamin C this store is dissipated in advanced tuberculosis before death, sometimes to a negligible quantity. The fate of about 60% of it is unknown. It is recommended that no patient should receive less than 0.84 mg. per kilogramme of body weight per day—that is, the generally accepted amount of 50 to 60 mg. daily—and that the quantity should be increased to 200 mg. a day progressively with the severity, activity, and duration of the disease. No benefit was noted in giving the vitamin in excess of the amount required for saturation. Thus the most generally accepted estimate of the daily requirement of vitamin C by the adult is 50 to 60 mg. daily, and much more in both chronic and acute illnesses and probably in wound healing. But it is most important to realize in making estimations of the vitamin C content of foods that often about half of this factor is lost in washing, soaking, and cooking the vegetables in water. The least loss is suffered by washing as quickly as possible, by steaming rather than by boiling, and, if any vegetable has to be soaked (e.g., dried peas), by using the water in which they have been soaked for boiling them also.

PNEUMONOCONIOSIS IN RUSSIA

We have received a series of papers summarizing research in dust diseases and the methods of fighting them, particularly among coal-miners, as carried out during the past few years by the Donetz Institute for Labour, Hygiene, and Occupational Diseases, U.S.S.R. In the main the methods of investigation and the conclusions reached are similar to those in other countries where much of the pioneer work on dust diseases was carried out. D. E. Shlimovitch agrees that the best measures for elimination of dust from the atmosphere of the mines include wet boring, good ventilation, and correct handling of explosives. A. V. Heiman found that electrolyte water solutions wet the dust more effectively than distilled water, hard mine water better than soft, and naphtha-soap solutions in small concentration—0.1%—best of all. He adopts the method of removing the dust at the time when it appears on the ground, because fine dispersed dust can be damped with water only with difficulty.

As regards the pathological anatomy and pathogenesis of silicotic fibrosis, V. A. Ravvin finds that dust particles are always present in the central as well as in the peripheral parts of the nodule, and agrees that the nodule arises as the effect of dust with a high silica content, and that no infection, specific or otherwise, plays a part in its formation. P. A. Enyakov concludes that fibrosis begins early in the cellular focus of the nodule, with the appearance of collagen and also of argilophil fibres. With Ravvin he found that coal dust as such—and not its mineral admixtures—is the basic factor which determines changes in the lungs in the case of occupational anthracosis. They used an almost ashless coal dust—0.25 to 0.69%—in their experiments on rabbits, and observed not only a large number of dust cells but also the beginning of formations like those which have been described under the name of "pseudotubercles" when dusting with pure mineral dust.

M. B. Zipzinsky experienced the usual difficulties in radiological diagnosis of the first stage of silicosis and obtained some help by administration of peptone, which, it is claimed, gives better definition of the early changes in the lymphatic system. Peptone acts as a lymphagogue, and a clear increase in the density of the markings in the vicinity of the lymphatics is thus observed radiologically. Zipzinsky recommends that in addition to the usual description of three stages of silicosis intermediate stages between Stages 1 and 2 and between Stages 2 and 3 should also be included for more exact definition of the progress of the disease.

In a monograph from the Ukrainian Central Tuberculosis Institute, Kharkov, Dr. I. I. Moshkovsky discusses tuberculosis and pneumonoconiosis among underground workers at the Vetka, Gorlovka, and Krystalny collieries, in the first two of which soft coal is mined, while anthracite is mined in the Krystalny collieries. Of the 1,329 men examined in the Vetka collieries pneumonoconiosis was found in 3.3%, and of the 987 men in the Gorlovka collieries in 2.3%, while 11.1% of the 298 in the Krystalny anthracite collieries showed the disease. Thus, as in other countries, the anthracite dust is the more dangerous. Moshkovsky found tuberculosis in 1.6% of the 1,315 underground workers in the Vetka collieries, while among surface workmen and wives of coal-miners the incidences were 3.5% and 2.5% respectively. At the Gorlovka collieries 1.2% of 992 underground workers were affected. Thus the Russian coal-miners, like those of other countries, show a low incidence of tuberculosis, and the selection of fit men, with rejection of unfit, is among the factors held responsible for this. The workmen are also examined periodically and, when necessary, transferred to lighter work. The Russian collieries are provided with hygienic devices, including warm showers and means of drying and changing clothes. The medical and sanitary service is situated as near as possible to the place where the miners work, with underground medical posts in the immediate vicinity. Those exposed to the risk of silicosis receive a free ration of milk, special clothes, one month's holiday annually, liberal treatment in dispensaries, hospitals, sanatoria, and spas, insurance grants, and pensions at a lower age than usual. Great care is thus being taken of the miners' welfare.

[19] *J. Amer. med. Ass.*, 1941, **116**, 669.
[20] Ibid., 1941, **116**, 469.

MEDICAL INFORMATION FILMS

The Films Division of the Ministry of Information recently gave a showing of three medical films, two of which were said to be "made for medical training." One of these two illustrated the history and technique of blood transfusion, and the other, which was in technicolour, the application of plastic surgery to war casualties. Both of them, but especially the latter, brought out the difficulty of combining in one film a certain amount of popular information with instruction for the serious student. The film on plastic surgery, with a commentary by the consultant adviser on that subject in the Emergency Medical Service,

has been already noticed in these columns (November 1, 1941, p. 622). While everyone who sees it must marvel at the triumphs of the surgical result and also at the beauty of the recording, no student could glean anything about plastic surgery from the film. It is a record of results only, in which the patients themselves, largely, tell what has happened to them. It does not come into the same category as the films in the Kodak Library which follow through the technique of operations. It has been made chiefly for America, and it will bring before audiences on the other side of the Atlantic a picture of what is being accomplished here by plastic and maxillo-facial surgery. The other film offered for "medical training" is a more ambitious production, made with the co-operation of the Medical Research Council and the Blood Transfusion Unit of the fighting Services. By means of animated cartoons it traces the history of discovery about the blood from the time of Galen, who found that the arteries contained blood and not air as the Alexandrian school had thought, through the first blood transfusion experiments which interested the Royal Society in 1665, the discovery of blood groups at the beginning of the present century, the use of anticoagulants, and the recognition of blood transfusion as a method of treatment in the last war, to the organization in 1921 of a service of blood donors in London. Some "shots" from the Institute of Blood Transfusion in Moscow illustrate the use of cadaver blood in Soviet medicine, but it is added that owing to inherent difficulties the method is now being less generally employed in Russia. The starting of a "blood bank" in Chicago in 1937, and the large use of blood transfusion in Spain during the civil war, are pictorially described, also the organization of blood supply depots in this country in 1939. The work of one such depot near London is shown in detail—the building up of a community of donors, the recording of groups, the precautions in taking blood, and the use of planes to transport whole blood or plasma to the front in France in the early part of the war. The preparation of plasma and of serum, the various clarification and filtration processes, the drying of both plasma and serum into a powder for use at a later date, the storing of blood in great refrigerators, were shown by most clever cartooning and photography. It is good, of course, for the medical student to have a general view of such a service, but this film again suffers from a double purpose, for sections of it are evidently intended for a wider public. The third film was frankly propagandist. It is a film made for the Ministry of Health and the Department of Health for Scotland in order to bring home to parents the need for inoculation of their children against diphtheria. It showed vividly, again by cartoon, the entrance of toxins into the blood stream, the formation of antitoxin, the carrying out of the Schick test and its reactions, the preparation of toxoid in the laboratory and its injection, and the immunizing ritual in schools. Altogether one of the most ably constructed pieces of film propaganda we have seen.

MASSIVE DOSES OF ARSENIC FOR SYPHILIS

Massive-dose arsenotherapy for early syphilis, whereby the disease may be completely cured by continuous treatment over a period of five days, sounds very attractive. An analysis of two recent articles[1] [2] may therefore be valuable in estimating the pros and cons of this method of treatment. Briefly, the method consists in injecting large amounts of an arsenical preparation by continuous intravenous drip over a period of a few days. At the start 4 grammes of neoarsphenamine were administered in five days; this form of treatment had to be abandoned owing to a fatal complication of treatment and the high incidence of peripheral neuritis (35%). In a second series mapharsen, being less toxic, was tried in a total dosage varying from 0.4 to 1.1 grammes; infectious relapse occurred so frequently, however, that it was realized that this dosage was insufficient. A third series was therefore treated with a total of 1.2 grammes of mapharsen with much improved results. In sero-negative cases results were excellent, but, needless to say, they were not so good in sero-positive primary and secondary cases. The period of observation has necessarily been limited, but up to the present the therapeutic results compare fairly well with those obtained by routine treatment, and cerebrospinal fluid examinations bear this out; it is considered that a single course of 1.2 grammes of mapharsen is likely to be unsuccessful in from 5 to 15% of cases.

It is when we come to a consideration of toxic phenomena that the disadvantages of the method are most apparent. Of the milder toxic effects, primary and secondary fever, toxicodermas, nausea, and vomiting are extremely common; peripheral neuritis is negligible when mapharsen is employed. Of the severer reactions jaundice and dermatitis have given little trouble, but cerebral symptoms suggestive of haemorrhagic encephalitis are comparatively common, and a fatality rate of about 0.3% may be expected. When comparing the results of massive-dose therapy with those obtained by time-honoured methods, only those patients who receive optimum amounts of treatment by each method should be considered. By these standards massive-dose therapy cannot be rated very highly. On the other hand, the fact that the optimum dosage can be given in almost every case by massive therapy, whereas a large number of cases receiving weekly injections over a long period default during treatment, is an argument in favour of the former. The possibility of curing the patient in five days instead of ten months or more has obvious advantages, and when it can be shown that the cure rate by massive therapy is at least as high, and the incidence of toxic effects as low, as those obtained by routine methods, a very strong case will have been made out for the former.

Certain practical difficulties in connexion with massive therapy present themselves. Every patient must enter hospital; this will entail the provision of a very large number of beds, and the initial cost is likely to be considerable. Secondly, will the average patient with early syphilis be willing to spend five days in hospital and risk losing his job when he could attend as an out-patient in his own time for weekly injections and so carry on his normal mode of life? As to the claim that patients are rid of their disease more rapidly, this does not carry much weight, because in an average case of early syphilis one or two injections of an arsenical will generally bring about the disappearance of surface spirochaetes. That massive-dose therapy possesses great possibilities none will deny, but until results are better and toxic effects reduced it cannot be recommended for universal adoption. Improvement in technique may be expected to bring this about, but until that happens the method should be reserved for selected cases treated by only the most competent syphilologists. One question remains outstanding. If, as is claimed, 0.01 gm. of mapharsen is equivalent to 0.1 gm. of neoarsphenamine, why is 1.2 gm. of the former required to produce results similar to those after 4 gm. of neoarsphenamine?

[1] *J. Amer. med Ass.*, 1941, **117**, 1154.
[2] Ibid., 1941, **117**, 1160.

TRAINING THE NEWLY COMMISSIONED ARMY MEDICAL OFFICER

BY

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It is thought that some account of the course of instruction and training given to R.A.M.C. officers on joining the Army may be of interest to many who are eligible for service and to the medical profession as a whole. The misconception is still prevalent that little or no Army training is necessary for the medical officer in order to fit him for efficient military service. This is far from being the case. The young medical officer has much to learn regarding his duties and behaviour as an officer and the efficient application of his medical knowledge to the needs of the Service. He must also acquire some knowledge of the Army as a whole, how it works, and what place he fills in it.

A Typical Course

To the practitioner without any previous military experience, coming direct from civil life, this may appear a formidable task. The difficulties, however, are much more apparent than real. There are two Depots and Training Establishments, R.A.M.C.—No. I and No. XI. At No. XI, the course at which is described below, newly commissioned officers are accommodated in a comfortable mess, where each officer has a well-furnished room. The course lasts for three weeks, and is followed by a week's course at the School of Hygiene. It has been designed with the three main objects of (1) serving as a period of introduction and adaptation to Army life, (2) providing the officer with sufficient medico-military knowledge to carry out his routine duties efficiently, and (3) giving him training and practice in man-mastership, leadership, and command. All the training aims at fitting the newly commissioned officer for active service. The course is progressive, the most essential and elementary instruction being given in the first week.

The newly joined officers arrive on Saturday morning. They report to the Officer-in-Charge, Officers' Wing, who records their previous professional experience and qualifications, and in the afternoon they are interviewed by the Commandant of the Depot, who welcomes them to the Army. Later in the evening they receive their first T.A.B. inoculation. Sunday morning is spent in completing various Army forms, applications for marriage and other allowances, etc. The Officer-in-Charge, Officers' Wing, in a short talk explains these intricate and important matters, and is followed by the Commandant, who briefly outlines the objects of the course and the various types of training which will be given. On Monday morning, battle dress, books, and web equipment are issued, and a coloured film illustrating the assembly of the web equipment is shown. A medical examination completes the morning.

On the Monday afternoon the course proper begins. It consists of lectures, practical work, drill, and physical training. Each day there are two periods of drill between the lectures, and each evening there is physical training in the gymnasium. The scope of the course may be best indicated by describing its component parts. These are basic military training, technical or medical instruction, chemical warfare training, physical training, and practical work, including field training.

Military Training.—This includes instruction in military law and military administration. These subjects are largely acquired by practical demonstration by the company commanders in the recruit companies. The following selection from the list of lectures on military subjects will give some idea of the ground covered: "Customs and conventions of the Service," "The duties of an officer," "The duties and work of a regimental medical officer," "The organization of the medical services (home)," "The organization of the infantry and armoured division," "The field ambulance and recent developments in the evacuation of casualties," "Pay duties and regimental accounts," "Message writing and official correspondence," "The administrative services."

Technical Training.—This is also partly practical and partly theoretical. Each officer attends the Depot Medical Inspection Room and is instructed how to conduct a sick parade, and there is a lecture on this subject. There are also lectures on: "The arrangements for dealing with sick in the United Kingdom," "Army medical categories," "Medical boards," "The inspection of barracks and the sanitary diary," "The control and prevention of venereal disease," "Psychological medicine." The last lecture is followed by a description of the valuable matrix test, which the students also carry out themselves. This test has proved its worth in this depot, where a considerable amount of work has been done on the subject of mental grading. There are also practical demonstrations on the subject of shock and blood transfusion and on the Thomas splint.

Chemical Warfare.—An intensive course on the medical aspects of chemical warfare is conducted during the first three days of the second week by the Training Officer, Anti-Gas, R.A.M.C. This course is most complete; in addition there are five periods of practical anti-gas training, and all students go through the gas chamber filled with nose gas, and are subjected to tear gas during field training.

Physical Training.—In addition to one period daily of practical physical training, this includes two lectures—one on applied physical training and the other on physical medicine. All officers are tested as swimmers, and compulsory swimming lessons are substituted for physical training in the case of non-swimmers. There is an excellent indoor swimming bath.

Practical Work and Field Training.—This includes practical map reading and a night exercise on this subject, a route march with instruction on march discipline, a very complete demonstration of a unit A.R.P. scheme, and a field exercise showing a regimental aid post and field ambulance advanced dressing station, and light sections on the ground, and the method of evacuating casualties. This occupies a whole afternoon. There is also an afternoon demonstration of hospital administration. The Commandant, in the third week, conducts a divisional exercise conference, showing how the medical services operate in warfare and how orders are issued verbatim at a series of conferences.

Much use is made of training films in colour. These have been made in the depot, and include films on shock, A.R.P., stretcher drill, web equipment, etc., and are shown with a running commentary. On the last Thursday of the course a two-hour written examination is held, and the course concludes on the Friday evening with a discussion group. Topics of general Army and Corps interest are discussed, and criticism of the course is invited. This is much enjoyed by the students. A typical course day lasts from 8.15 a.m. to 5 p.m., and frequently later in the evening. The work is intensive, but well within the powers of the average man. The amount of knowledge acquired is very considerable, and the rapidity with which the newly joined officer adapts himself to the Army and the keenness displayed are amazing. Reports are constantly being received from officers who have taken the course confirming the practical value of the instruction imparted. There is no doubt that these courses play a very important part in smoothing the path and increasing the efficiency and morale of the medical officer entering the Service.

The annual report for 1940 of the National Institute for Research in Dairying gives an account of the work of the four main departments of the institute, and of the experimental dairy and the library, with a list of papers published by members of the staff during the period under review. There is also a section on the Research Institute in wartime and its important bearings on national nutrition and health. The institute has shelved for the time being a number of long-range research projects so as to devote more time to advisory work and short-range investigations on some of the wartime problems of the dairy industry, and to anticipate and solve other potential wartime problems before they actually arise in practice. The institute forms part of the University of Reading and is situated at Shinfield.

REFITTING FOR INDUSTRY

THE BIRMINGHAM ACCIDENT HOSPITAL

Industry has its casualties as numerous, though not as lethal, as those of war. According to a pre-war estimate, of the general distribution of industrial accidents usually reported, less than 1% resulted in death, about 5% in permanent disability, and 94% in temporary disability. One-third of the temporarily disabled are away from work for less than a week, two-thirds for less than a month, and only about one in twenty is away for more than three months. How far the new risks and accelerated pace of wartime production have been countered by extended methods of precaution and protection cannot be said, but it is obvious that with the entrance into industry of many people, especially lads and women who have never been in it before, and of others returning after long periods of unemployment, industrial casualties are likely to be higher. Another multiplying factor is the black-out, and yet another the restriction of the usual holidays and off-times. In the Birmingham area during the past two years the number of industrial casualties requiring treatment at hospital—mainly, of course, as out-patients—is said to have increased by 40%, and the annual total of such cases to be well over 100,000. This leaves out of the reckoning the large number of cases which are dealt with, without resort to hospital, by the medical and nursing services in the larger factories or by private practitioners. In six large West Midland firms which have organized medical services it is estimated that there are three-quarters of a million attendances each year for treatment of minor injuries. What all this means in lessened man-power and upset of production and service can only be conjectured.

From General to Special Hospital

In April of last year the old Queen's Hospital at Birmingham turned round in a night from being a general hospital with a century of history behind it to being a specialized one for the treatment and rehabilitation of persons injured in the industrial machine or in road accidents. The first nine months of this Accident Hospital—the first of its kind in Great Britain—have been a period of preparation and re-equipment, and it will not be up to capacity until next May. But in nine months it has had nearly 1,500 in-patients, and its new out-patients have numbered over 11,000. The latter are now attending at the rate of 350 a week. The expenditure of the hospital is estimated at £60,000 a year, to be met, as to two-thirds, by the Hospital Contributory Association, the Ministry of Health, and the Birmingham Corporation, and as to the remaining one-third by a subsidy from industry. Already, without any special appeal, industry has provided £10,000 towards the hospital in its first year. It is suggested that each industrial concern should pay two shillings a year per employee. One splendid gift has been made by the Austin Motor Company in the shape of a six-wheeled ambulance with full facilities for emergency and resuscitation work. This will be staffed by doctors and trained nurses from the hospital, and will be available at all hours of day and night.

A Centre for Instruction

All hospitals in industrial areas, of course, afford good service to industry. The Birmingham Accident Hospital is distinctive, not only because it is entirely a casualty service, but for several other reasons. It is intended to be a training centre for industrial nurses and ambulance and first-aid workers. A scheme for the training of such nurses has been prepared by the board of the hospital in collaboration with the Royal College of Nursing, and it is expected that Birmingham University will grant a certificate. Another link with the University will be the hospital in its function as a teaching centre for undergraduate and postgraduate medical students. It is also intended to make it a centre for industrial medical officers attached to the various works. Here they will hold regular meetings with the medical staff, and clinical records of patients which are of common interest will be discussed. It may even become a centre from which industrial medical officers are recruited.

Rehabilitation of Casualties

But an accident hospital has only completed half its work when it has given the surgical or other necessary treatment to the casualty. The Birmingham Accident Hospital appends "Rehabilitation Centre" to its title. It intends to carry on the treatment of its patients until they are fit to return to work, and its interest in them will follow their re-employment. The patients will be given graduated and supervised exercises in hospital with occupational and recreational therapy as they become suitable for it, supplemented by the usual physical and electrical treatments. Vocational training centres may be established, perhaps in the larger factories, in association with the hospital, for those permanently unfit to resume their old occupation. It is here that the Birmingham hospital meets a great social need. The industrial casualty has always, at any rate in recent years, commanded the best surgical skill and hospital care, but the real tragedy of the accident is experienced only when the man no longer needs what the hospital can afford but is not able to return to work. Workmen's compensation is a poor substitute for restoration of working capacity. Any self-respecting workman would rather have a restored muscle than a money payment. In following the patient back to work, checking the results of treatment, grading him for lighter duty, or fitting him into a new job, the Accident Hospital will be rendering its greatest service. But obviously it can only do this properly in closest collaboration with the works doctors, who know better than the hospital staff what physical or nervous demands the old job or the new one may make and how far the recovered patient can meet them. A difficulty is that very many of the smaller firms have no industrial medical officer, and to make contact here the board of the hospital is appointing a liaison officer who will get in touch with these firms and presumably also with the private practitioners to whom their employees are mostly entrusted.

The report of the Committee on Industrial Health, set up by the British Medical Association, was prepared before any experience of the Birmingham Accident Hospital was available, though the fact of its establishment is mentioned. Any extension of hospital facilities for the treatment of industrial accidents was welcomed by the Committee, though it was added that such services must not be confused with the Committee's purpose of urging the extension of medical supervision in the factories themselves. Birmingham is fortunate in having the first accident hospital, which should be the forerunner of others in the various industrial areas.

M. L. Saldun de Rodriguez, J. A. Soto, and J. Giampietro (*Arch. Ped. Urug.*, 1941, **12**, 549) describe a case of cysticercosis in a Spanish child of 14 who had come to Uruguay six years previously. The family bred pigs and ate a great quantity of raw and cooked pork. The child had various intestinal parasites. At 11½ she developed attacks of an epileptic type, at first mild and of short duration but becoming more intense, with all the characteristics of true epilepsy. Clinical and laboratory examinations showed no abnormalities, but radiography revealed the presence of numerous nodules which were diagnosed as calcified cysticerci. Similar nodules were also demonstrated radiographically in the lower limbs, but opposition by the family and the patient prevented biopsy. Various arsenicals were given without result. The authors state that human cysticercosis is almost unknown in Uruguay, only two adult cases having been described, one of which was diagnosed at necropsy and the other one by *x* rays. The authors' is the first case in a child described in Uruguay and they have been unable to find any others in South American medical literature. They could trace only one European record of the occurrence of cysticercosis in a child—the case described by Austoni.

Nova et Vetera

AN EXHIBITION OF EARLY ENGLISH MEDICINE

The Warburg Institute, forced to suspend activities in Germany some years before the war, brought its entire staff and plant to London. It is established at the Imperial Institute at South Kensington, and is now an integral part of the University of London. Its work bears directly on the history of art, and it has opened an exhibition of the art-relations of this country with the Mediterranean. The exhibits are photographic. They extend through the ages from prehistoric times to the twentieth century. Of the sixty-five sections, one, dealing with the Anglo-Saxon period, is specifically medical.

There have survived a number of medical works of Anglo-Saxon origin. Some are in Latin and some in the Early English language. The favourite medical work of the age was a debased compilation, known as the *Herbarium* of "Apuleius Platonicus," which was originally put together in South Italy in the fifth century. It was translated into Anglo-Saxon somewhere about the year 1000. Beautifully illuminated Anglo-Saxon copies have been selected by the Warburg Institute for exhibition. There is also shown a Latin manuscript of this text from the Bodleian Library. It was written and illustrated about the year 1120 by a monk at Bury St. Edmunds. Most of the drawings, like the text, have been copied from a Mediterranean original. In addition to the interest of this relationship is the fact that some of the drawings indicate that the artist occasionally identified the plants he was painting and tried to improve on his models. This direct appeal to Nature is an extremely rare event in documents of the period, and every case of it is worth recording. To his drawings of plants he added those of animals in a lively, vigorous, and, occasionally, even in a humorous style. Here, too, his draughtsmanship is very exceptional for the time.

A Beautiful Anglo-Saxon MS.

The glory of the medical section is, however, a magnificent document in the British Museum in the English language. It was written earlier than the Bury St. Edmunds manuscript—perhaps about A.D. 1050 or even earlier—and, presumably, in Wessex. It is the most beautiful of Anglo-Saxon medical manuscripts and takes a place of considerable importance among the monuments of Anglo-Saxon art. Its classical origin is convincingly demonstrated in its very first page, where Chiron, the wise centaur, skilled in drugs, delivers herbs and a herbal volume to Aesculapius, god of medicine. Aesculapius in his turn hands them to Apuleius Platonicus, reputed author of the *Herbarium*, who is here, by an odd error, called Plato by the Anglo-Saxon artist! The picture is meant to illustrate the mythical descent of herbal lore, and it does in fact demonstrate the Mediterranean origin of the Anglo-Saxon medical system. On another page of the same manuscript the exhibit shows a vigorous drawing of a fight between a snake and a scorpion. The outline of the scorpion is remarkably faithful. The artist of the manuscript from which this copy was derived must have been familiar with scorpions in his Mediterranean home. On the same page is a figure of a plant named "solago minor," which probably corresponds to the *Heliotropium europaeum* of botanists.

Yet another interesting page of the same herbal is shown with an admirable picture of a plant glossed by a twelfth-century hand as "henne belle." The drawing is so accurate that a botanical diagnosis is here possible. It is, in fact, *Hyoscyamus reticulatus*, a species which is not native to England, but grows wild freely in more arid Mediterranean lands. A further very interesting page exhibited shows a plant called by the artist "naddre wyrt"—that is, snake plant. It is unmistakably that plant adored by classical poets, the asphodel. These early herbals prescribe juices made from the boiled roots of asphodel against snake-bites, ulcers, boils, and abscesses. The word "asphodel" has altered in our modern speech into "daffodil," and yet further into the unrecognizable "daffydowndilly." The Bury St. Edmunds herbal shows quite clearly this daffodil, Lent lily, *Narcissus pseudonarcissus* of Linnaeus, naming it "asphodel."

Some Interesting Documents

In another section, devoted to the "Transmission of Natural Science," there are also items of medical interest. Thus a manuscript at Durham of about the same date as the Bury St. Edmunds manuscript illustrates Early English surgery. It shows especially the process of cauterization, which was an important mediaeval operation. Different parts of the body were seared with a hot iron for treatment of various diseases. The pattern of the searing that was recommended varied with the nature and site of the lesion. The illustrations in the Durham manuscript, which is of English workmanship of about 1130, show a patient resting on a classical seat, which was obviously copied from an ancient manuscript.

Another interesting document in the same section is that known as the *Marvels of the East*. There are several copies of it, and one of them, in the British Museum, is by the same scribe as wrote the only copy of the famous poem *Beowulf*. This strange book, of which the copy exhibited is of about the year 1000, may, in modern usage, be called an early textbook on ethnology based on a fictitious diary. The Latin original emanated from the tales brought by travellers from India with descriptions of fabulous races of the East, of strange animals, plants, and stones. Here and there are memories of stories from Herodotus. This collection somehow travelled to England together with pictures illustrating them. The stories were perhaps developed a little in this country, for the illustrations, though they show their classical origin, do not always tally either with the Latin text or with the Early English translation. Thus, where the text talks of people "born men, down to the middle, then wild asses with bird-like legs," the illustration shows a centaur, for this was a type of half-animal half-human monster which had been familiar to the antique artist and was often copied in Anglo-Saxon art. Again, the text speaks of "dragons 150 feet long," but the painter shows a theme common in late Egyptian statuary, of two snakes intertwined. The emblem passed into the more usual classical symbol of Aesculapius, which perhaps became confused with the caduceus of Mercury, the messenger of the gods. It is still familiar on the lapel of every officer of the R.A.M.C.

CHARLES SINGER.

Our notice of Dr. David Daniel Davis, who died in 1841, gave his birthplace as Caernarvon, following the entry in the *Dictionary of National Biography* written by Sir Norman Moore. We now learn from Prof. Miles H. Phillips and from Lieut.-Colonel A. H. D. Smith that this is incorrect. It seems to be certain that Dr. Davis (or Davies), physician-accoucheur at the birth of Queen Victoria in 1819, was a native of Llandefeilog, near Carmarthen. An article in the *Western Mail and North Wales News* published last year says that Tredegar Cottage, Llandefeilog, where he was born, was demolished only recently during the carrying out of a road improvement scheme. It stood about four miles from Carmarthen on the Kidwelly Road.

Nell Hirschberg and I. P. Bronstein (*Amer. J. med. Sci.*, 1941, **202**, 333) have observed the response of a cretin to typhoid inoculation. An agglutination test on April 20 was negative; on the 23rd the patient was given 0.5 c.cm. of a stock typhoid vaccine, and 0.75 c.cm. seven days later. An agglutination test on May 2 was negative, and the patient was given 1 c.cm. of the vaccine on May 7. Agglutination tests two and six days later were both negative, and again on June 30, when thyroid therapy (1/2 grain daily) was started. The dose was increased to 1 grain daily on June 28, when an agglutination test showed partial agglutination in a dilution of 1 in 80. The dose of thyroid was increased to 2 grains daily, and an agglutination test on February 1 the following year showed a strong positive titre of 1 in 80.

Reports of Societies

BRITISH ORTHOPAEDIC ASSOCIATION

ANNUAL MEETING

The British Orthopaedic Association held its Annual Meeting for 1941 in Oxford on January 2 and 3. It was attended by a large number of members and visitors, including a good representation from the United States and from Canada. The meeting was opened by the President, Prof. T. P. McMURRAY, who later handed over the chair to his successor in office, Mr. G. R. GIRDLESTONE. Honorary membership of the association was conferred upon Prof. P. D. Wilson of New York.

Prof. McMURRAY, in his presidential address on "Conservatism in Orthopaedic Surgery," said that operations in orthopaedics were often only a stage in the restoration of function. Orthopaedic surgeons should not let their minds be deflected from the larger questions of conservatism, which had become so much wider in the past few years, including re-education and rehabilitation of the crippled and injured. The orthopaedic surgeon must be trained in all the methods by which function can be restored. It was because of the broad outlook of certain surgeons in the matters of diagnosis, prevention, and treatment that the specialty of orthopaedic surgery had been formed. Failure to maintain the traditional outlook of orthopaedics would only encourage the formation of separate groups, who would concern themselves with special non-operative therapeutic departments.

Prof. P. D. WILSON gave a brief review of the history of arthroplasty of the hip-joint, and discussed the two methods now employed: (*a*) by fascial interposition, with a history of twenty years, and (*b*) the use of vitallium cups, during the past three or four years. In his own group of 39 patients 45 arthroplasties had been performed, of which 41 operations had been followed up. Of these latter, 12 operations were by fascial interposition and 28 by the cup method. The best results in both types were obtained where there was solid bony ankylosis, in which the peri-articular scarring and adhesion were less than in fibrous ankylosis. Statistics tended to show a slightly better functional result by the fascial interposition method, but this was somewhat counterbalanced by the simpler technique and easier post-operative recovery in those patients operated upon with the use of vitallium cups. Actually, the poor results with the vitallium cup were obtained largely in the group of arthritic patients; it was known that the fascial method would have given poor results in these patients, but it was thought important to learn what might be accomplished for them by the newer method. The best results in the series were obtained in conditions the result of trauma or septic necrosis. With the vitallium cup a wider range of use was established in old unreduced congenital dislocations.

Communications were also made on the following: "Some Observations on Paget's Disease," by Mr. A. ROCYN JONES; "Recurrent Dislocation of the Shoulder," by Mr. A. L. EYRE-BROOKE; "Bone-grafting of the Fractured Carpal Scaphoid," by Squadron Leader J. R. ARMSTRONG; "Ossification about the Elbow-joint," by Mr. GEOFFREY HYMAN; "Pelvic Dislocation," by Mr. R. G. TAYLOR.

Special efforts are to be made in Scotland to discover and to treat any overstrain in war workers, especially in workers between the ages of 15 and 25. Every panel doctor in Glasgow and on Clydeside has been asked to watch for any indications of weakened resistance to disease in workers coming to him for treatment. The causes of such lowered resistance will be investigated through the Health Department's Regional Medical Officer, and provision is to be made for periods of rest for the worker in convalescent homes, for hospital care where the worker cannot be nursed in his billet, and for domiciliary nursing. Special facilities for diagnosis are to be available at emergency hospitals.

Correspondence

Delay in the Union of Fractures

SIR,—The opportune paper by Prof. T. P. McMurray (January 3, p. 8) recalls the strong impression that delay in the union of fractures has considerably increased since the much more forcible extension which the pin method allows has come into use. I cannot, however, supply any figures in support of this. Time and again over many years we tried all the special foods and vitamin preparations, with no apparent effect. All patients had a generous diet and extra milk.

Now perfect extension to obliterate angulation and obtain mended-china union, which we all aim at, is not Nature's way of healing a fracture. In the surgery museum at Aberdeen there are two examples of rock-like union of severe fractures that occurred in wild animals. Though deformity and overlapping are considerable, the re-formation of grooves for the tendons shows that functional use had been good.

A probable, but at present speculative, explanation of delayed union has often occurred to me; speculative because of the absence of post-mortem records in early cases. This explanation is that the traction sucks the periosteum and external callus into the gap between the bones and at the same time narrows the lumen of each delicate, growing vessel in the neighbourhood, in much the same way that stretching a rubber tube narrows and deforms its lumen. The application of a closely fitting plaster case must also press on the external callus. Indeed, it is difficult to see how any such callus can form properly to start with if the casing is really a close fit and applied early. If some pathological evidence could be collected—for instance, from patients who have died of fat embolism after pin extension has been used—I believe our knowledge of the causes of delayed union would be greatly advanced.—I am, etc.,

London, W 1. G. H. COLT.

SIR,—An important aspect of the treatment of fractures has recently been discussed in your columns. First, Prof. T. P. McMurray (January 3, p. 8) gave examples of fractures which had failed to join when treated by complete immobilization, but which united rapidly as soon as comparative freedom was permitted. Then Dr. N. S. Finzi (January 17, p. 88) supported the view that we might be using too much immobilization. It seems that this idea that movement is an important part of the treatment of a fracture has tended to fade, because it is apparently incompatible with what is called "adequate" immobilization.

At this hospital we receive, from different parts of the country, patients who have had their fractures treated along orthodox lines. On admission they are still in plaster, and when this is removed a horrid spectacle all too often appears: a cold, scaly skin, wasted muscles, stiff joints, and, altogether, a limb which the patient does not know how to use. Confronted with this grisly sight, one's first question is not "Has the bone joined?" but "Is this thing alive?"

The routine treatment for such limbs falls naturally into two stages. First, the limb must be restored to life, and, second, the fracture must be repaired. This latter stage is not begun until the skin looks fairly healthy, the muscles are working again, and a decent circulation is re-established. Even then the treatment of the fracture *per se* is carried out with a minimal sacrifice of the soft parts. Whatever splintage is to be used, voluntary muscular action is insisted upon throughout the treatment. This muscle contraction serves the following purposes: (1) It keeps the circulation flowing in the limb. (2) The joints are prevented from getting stiff. (3) It maintains an impacting force at the fracture site. (4) The patient is not allowed to forget how to use his limb.

In addition the limb must usually be immobilized, and the vital question now becomes: What do we mean by "adequate" immobilization? Adequate for what? Obviously not for bony union alone, for the muscles plus the most meagre splints will often suffice for that: indeed, as Prof. McMurray's examples seem to show, a degree of immobilization sufficient to be sure of keeping the bone-ends still may delay or even prevent union.

No, the answer must surely be that immobilization must be adequate to maintain good position during the period of union.

These principles have been clearly set out by George Perkins in his book on *Fractures* (p. 18) as follows:

"It is important to realize that fixation is used for two purposes: (1) To hold the fragments immobile. (2) To maintain the fragments in good position. Usually fixation is employed for the second purpose and only occasionally for the first: this is contrary to general belief. A greenstick fracture of the radius and ulna in a child obviously does not require a splint to immobilize the fragments, but it does to maintain a good position. Again, in the common Pott's and Colles's fractures splints are used only to maintain reduction and not to immobilize the fragments, for if these fractures are undiagnosed and therefore unsplinted repair always occurs. The absence of splintage in these fractures results in *mal-union* and not *non-union*.

Both doctor and patient are under a misapprehension in believing, as they commonly do, that a bone repairs because it is splinted and that it will not repair unless it is splinted. It is quite true that a fracture will not repair if the bone-ends are not held immobile, but the muscles can usually be relied upon to do this—e.g., in a fracture of the middle of the shaft of the femur the ends are immobilized by muscle action and the alignment maintained by longitudinal traction.

If, however, there are no muscles attached to one fragment (as in a fracture of the neck of the femur) or to both fragments (as in a fracture of the scaphoid) there is not any internal mechanism for holding the bone-ends immobile, and in these circumstances fixation is required not only to maintain good position but also to prevent the bone-ends from moving on one another. And it is these cases that require fixation for immobilization that demonstrate how inefficient external fixation usually is, because *non-union* is common in both these fractures.

It is important to realize for which purpose fixation is being used; because if used for immobilizing the bone-ends fixation must be more exact, more continuous, and applied for a longer time than when it is being used solely to maintain a good position.

Fixation may not be needed for either purpose; as regards the first purpose—to hold the fragments immobile—the ends may be impacted or the muscles may be capable of holding the ends. And as regards the second purpose—to maintain the fragments in good position—the position may be perfect or it may be impossible to obtain a better position or it may be unnecessary to obtain more than an approximate reduction.

Fixation should not be used unless it is essential for one or other or both purposes, because it interferes with the treatment of the soft parts. Fixation should be looked upon as a necessary evil, to be discarded whenever possible."

—I am, etc.,

A. GRAHAM APLEY, F.R.C.S.

Queen Mary's (Roehampton) Hospital.

Sacro-iliac Strain

SIR,—There will be many of us who will recall vividly the advent of the first of the orthopaedic surgeons from America who came to help us during the war of 1914-18; and they will also surely remember how Joel Goldthwait, Robert Osgood, and others demonstrated to us the cases of sacro-iliac strain and pointed out the remedies that they were accustomed to use. This was, so far as I know, the first occasion on which medical attention in this country had been fixed upon this region of the body as a source of human suffering. Although so many years have elapsed since the light dawned, the importance of Goldthwait's teaching has been all too little appreciated in this country, while the manipulative side of treatment is still regarded with an element of scepticism in many quarters. In recent papers and correspondence there is no mention of Ober's comparatively recent work on the role of the ilio-tibial band in cases of low backache, and that mixed combination of symptoms commonly known as sciatica. Yet there can be no doubt that this role is a very important one, and perhaps it may even be said that loss of elasticity in this band is the most prominent single cause of chronic low backache, recurring attacks of sacro-iliac strain (commonly known as lumbago) and vague "sciatic" symptoms. Therefore all this means that differential diagnosis is absolutely at fault

With regard to treatment, there are countless cases in which patients who complain of pain in the back or pain in the leg can be remedied by manipulation, others can be remedied by support, others by attention to footgear and posture, and yet others by injection with novocain or (not mentioned in any of these papers) subcutaneous infiltration with oxygen. Even massage has come into its own again in the treatment of the taut ilio-tibial band. The diagnosis of this condition is of so great importance that I venture once more to draw attention to examination.

The patient is placed in the side-lying position with the leg next the couch bent to a right-angle at hip and knee. The uppermost hand of the patient clasps the back of the thigh of this leg close to the knee. The pelvis is placed in the vertical; the knee of the top leg is bent to a right-angle and maintained in this position; the thigh is abducted and extended as far as it will go, and is then dropped towards the couch. If it fails to reach this surface there is an insufficiency of the ilio-tibial band. Further confirmation is usually found in sensitive areas above the trochanter, in the middle of the thigh, sometimes above the knee, and in the lowest interspinous ligament. Unless these points are quite unusually sensitive much may be done by massage and exercises to restore the lost mobility; but if it fails, division of the band after Ober's technique is more than desirable. As in other surgery the technique is all-important, and some people have damned the operation merely because the technique has not been followed in its entirety.—I am, etc.,

London, N.W.1 JAMES MENNELL.

SIR,—The experience of Dr. W. Edwards and his patient with sacro-iliac pain, as related by him (January 24, p. 126), shows again the difficulties and misconception attending the diagnosis of the causation of low back pains, not to speak of the vagueness of some of the treatments given. Surely, as related by him, Dr. Edwards's patient certainly had rather vague rationale in the treatments given. It is impossible to manipulate a joint that has been stiffened by an arthrodesis, as it would appear was done in this case. The fact that the persisting pain in the back was cured by a subsequent manipulation, performed after the manner recently described by Mr. Jennings Marshall (January 3, p. 22), suggests that the causation of the original pain was not in the sacro-iliac joint at all but in the area of the lumbo-sacral joint or adhesions about the lower lumbar articulations.

The differential diagnosis of these low back lesions was very lucidly set out in an article by Mr. Lawrence Abel in the *Journal* of April 1, 1939 (p. 683), in the series "Surgical Procedures in General Practice." The manipulative procedure used by Mr. Jennings Marshall and described in his letter appears to me to be a composite manipulation of both sacro-iliac, lumbo-sacral, and lower lumbar spine joints. With the patient lying prone, forced flexion of the hips, with the knees flexed, surely pushes mainly on the lower abdomen and sacro-iliac joint through it. Then rotating the pelvis as a whole backwards causes the sacrum to tilt backwards, in turn pulling back the fifth lumbar vertebra and the other lumbar vertebrae until the lumbar lordosis is flattened out and the lumbar spine is flat on the couch. This manipulation is usually carried out for adhesions in the region of the lumbo-sacral joint or lower lumbar spine, not for sacro-iliac joint manipulation.

The procedure usually carried out by orthopaedic surgeons and physiotherapists for manipulation of the sacro-iliac joint is one of the following clear-cut procedures which rely on direct rotation or pressure on the ilium.

(*a*) Flexing the hip forcibly with a straight knee until the foot all but touches the shoulder. This procedure acts by the hamstrings pulling on the tuber ischii and thus causing a true rotation of the ilium about a horizontal axis through the sacro-iliac joint. This rotation in an anterior posterior direction is limited by the tension of the posterior ligament.

(*b*) With the patient lying on his good side, the blade of the ilium is forcibly and suddenly jerked inwards towards its fellow, while at the same time the operator exerts a counter-pull by pulling on the shoulder outwards, or alternatively keeping both shoulders flat on the couch. This procedure acts by opening up the obliquely placed sacro-iliac joint until the posterior sacro-iliac ligament is taut. It does not correct any rotatory subluxation as does the former manipulation.

(*c*) The reverse movement is the manipulation recently advocated by Dr. James Cyriax (December 13, p. 847). In this case the two iliac crests are forcibly separated by pulling on the anterior superior iliac spines in an outward direction, thus opening up or splaying the pelvis. This opens up the sacro-iliac joints until the *anterior* ligaments are taut.

(*d*) The iliac crest of the affected side may be forcibly gripped and rotated backwards in a posterior direction, with the patient lying flat. This causes a rotation of the ilium again around a horizontal axis of the sacro-iliac joint.

Finally the pelvis and lumbar spine, after one of the above manipulations has been carried out, is just literally shaken. This is supposed to put the final adjustment to any bone that may have been out of place—according to the unqualified manipulators.

I venture to reiterate these manœuvres, because nothing can be so dramatic as the relief of pain given by manipulation and the fitting of a proper sacro-iliac belt to a patient who has hitherto been crippled with nagging pain due to a ricked or sprained sacro-iliac joint.—I am, etc.,

National Temperance Hospital, N.W.1. G. O. TIPPETT, F.R.C.S.

Sciatic Pain

SIR,—The report of the discussion on sciatic pain by members of the Sections of Neurology and of Orthopaedics of the Royal Society of Medicine (January 31, p. 159) shows inaccurate thinking about the value of manipulation in cases of referred sciatic pain and an obvious failure to diagnose the types of cases that are satisfactorily treated by manipulation. The few speakers who apparently referred to manipulation at all gave it but scant consideration, and there seems to have been a complete absence during the discussion of any knowledgeable information about this aspect of the subject. It is by no means impossible, as a result of continuous study and accurate examination, to diagnose with a tolerable degree of accuracy cases of referred sciatic pain which are due, if not entirely, certainly largely to acute or chronic strain or imbalance of the joints of the pelvis and lumbar spine.

As long as the medical profession refuses to investigate fairly and unbiasedly the whole question of manipulation, so long will muddled and insufficient knowledge be all that is available for the profession; and so long as hit-or-miss manipulative technique, under an anaesthetic, is employed so long will poor results continue to be obtained. Nobody ought to be allowed to learn manipulation or bone-setting upon anaesthetized patients; the manipulative art should be practised on conscious subjects, as thereby, among other things, the control of the force of the manipulation—an all-important factor in its success—is learned. (Indeed, it is only when a referred sciatic pain is so acute as to prevent the patient from relaxing sufficiently to enable the operator to manipulate the joints affected that an anaesthetic is a necessity—it is an expedient in certain cases where time or the patient's circumstances prevent the requisite number of treatments without an anaesthetic.)

It is this lackadaisical attitude towards manipulation on the part of the medical profession which has left, and will leave, this highly satisfactory and essential branch of medicine completely in the hands of the osteopathic profession.—I am, etc.,

London, W.1. GEORGE MACDONALD.

Periodic Somnolence and Morbid Hunger

SIR,—In their extremely interesting communication (January 31) Surgeon Captain Macdonald Critchley and Surgeon Commander Lovell Hoffman bring out one point clearly, and that is the fact that *action* is what is mainly impaired, and apparently directly and not as a secondary effect through affective disturbances. One would have liked some data of body-temperature variations during the different states, with a possible reference to the part played by adrenal secretion.

In his book *The Still Reaction* J. G. Byrne reaches some very interesting and stimulating conclusions. Whilst it is impossible to go into these in detail, the following are worth recording: (*a*) "In death feigning as in sleep, trance, hypnosis, etc., *there is focal awareness of the situation and impaired awareness for everything else in the external world.*" In the "still reaction" Byrne includes all degrees—e.g., deep sleep, death feigning, pseudo-death feigning, hibernation torpor, comatose states, etc. In all reactions there are awareness and purpose, but not necessarily a degree of awareness amounting to conscious purpose. (*b*) "The sleep or pseudo-still reaction of the higher animals and of man is a higher specialization—due to differentiation of mechanism—of the torpor of primitive sleep (pseudo-death feigning) which occurs in insects." (*c*) "Hibernation torpor is conditioned mainly by fatigue of the mechanisms which mediate reflex adrenal secretion, the deficiency of cortin and adrenin in the blood, consequent upon such fatigue, causing lowering of the body temperature, this latter in turn being the main cause of the persistence of the torpor." (*d*) "Like sleep, the taking of food, and, in more remote sense, indulgence of the sexual appetite, are responses of the organism to a chronic danger situation." (*e*) "Sleep had its origin in an adaptation which enabled the organism to continue to meet danger situations—chiefly acute—by reacting efficiently in avoidance or approach (aggression)—under the guidance of the distance receptors (hairs, etc.) mainly—instead of reacting by feigning death in response to actual contacts; sleep is, therefore, rooted in feigning as a means of defence and aggression." (*f*) "The still reaction of the higher psychic level is the static alternative of one or other of the two dynamic reactions—namely, of avoidance or approach."

Byrne goes on to point out that the mature "still reaction" is a neutral state of alert awareness in a danger situation, and, owing to its ready reversibility, can seize on the opportunity for avoidance or approach because the individual has a full awareness of the perceptual field. It would be very interesting to try out some of these conclusions on this syndrome.—I am, etc.,

London, N.W.8. JOHN MACKWOOD.

Vitaminized Margarine

SIR,—In your leader on page 47 of the *Journal* for January 10 you told us something of the mystery surrounding the vitamin content of margarine. Official reticence on this point has just been broken, and we are informed in the Ministry of Food Bulletin No. 122, of January 23, 1942, that "in February, 1940, margarine was fortified by adding 550 units of vitamin A and 30 units of vitamin D per ounce, so as to make it equivalent to 'grass-fed' butter. From the beginning of this year the vitamin D content was brought up to 60 units to make up for the lack of this vitamin from eggs."

So far so good; we have at last been given some definite figures. It is unfortunate, however, that the statement should include misleading comparisons with butter. Granted that the old vitaminized margarine was, if anything, higher in vitamin D potency than summer butter and that the present one is therefore more than twice as strong, the fact remains that "grass-fed" butter has a vitamin A activity of at least 1,000 I.U. per ounce and is frequently more potent.[1] The Ministry may have good reasons to put into margarine only half this quantity, but it should not claim to have made the product to the image and likeness of summer butter.—I am, etc.,

National Institute for Research in Dairying, Shinfield. S. K. KON.

Regional Anaesthesia

SIR,—I shall be glad if you will give me an opportunity to deal with some of the points raised by your correspondents on the article by Mr. H. W. Burge and myself in the *Journal* of December 27 (p. 906).

Space alone prevents me from dealing seriatim with the "few observations" of Dr. Ronald Jarman (January 17, p. 87). His methods are well known and successful, and it is therefore understandable that they commend themselves to him. They are not, however, a justification for his evident tendency to regard other methods as devoid of merit. It would have been reasonable to expect that experience would have informed him of the necessity for avoiding rigidity of method. An error on his part having been corrected by Flying Officer E. A. Pask (January 31, p. 164), it seems only necessary to deal with such few of his remaining observations as are either relevant or important.

1. This is an old worn-out excuse for the lamentable lack of interest in regional anaesthesia by most anaesthetists and surgeons in this country. Even if Dr. Jarman's assertion were true as regards the Continent, it could not be applied to America. Such renowned experts as Lundy, Rovenstine, and Tovell, to quote only three, exceed most specialist anaesthetists in this

[1] e.g. Coward and Morgan, *British Medical Journal*, 1935, **2**, 1041; Coward *Biological Standardization of Vitamins*, 1938, p. 223 (London: Baillière, Tindall and Cox); and Booth, Kon, and Gillam, *Biochem. J.*, 1934, **28**, 2169

country for proficiency and general range of technique. But if one is to go by their recent publications one cannot but form the opinion that they are becoming more and more enthusiastic over regional anaesthesia, especially when combined with light general narcosis in the manner first suggested by Crile.

2. Spinal anaesthesia: I do not propose to engage with Dr. Jarman in a contest of comparative experience. The value of new methods and technique is determined by general use, not by general experience or inexperience of their originators. We did not desire to criticize Doglotti ; we said, and I reaffirm the opinion, that epidural block is neither reliable nor safe in *grave abdominal cases*. Dr. Jarman has neglected to notice the last three words in this connexion and to observe that we did not criticize epidural block in Doglotti's hands.

3. The use of the intravenous route for giving pre-operative sedation is not governed by any question of immediate operation. The simple fact is that it is the most accurate way of regulating the dosage to the patient's requirements. It also brings him instant relief instead of his having to wait half an hour or more before the drug takes effect if it has been given subcutaneously. During the slow intravenous injection of omnopon in a case of perforated peptic ulcer the dramatic change of expression on the patient's face has to be seen to be believed. I do not believe that a small single dose of atropine "tends to produce a mild or severe degree of ileus." Scopolamine is superior to atropine in that it has an added mild sedative effect in most cases, whereas atropine is a general stimulant. We had been using atropine because of a request that the use of scopolamine should be limited as much as possible as a wartime economy measure. Hyoscyaminae sulphas gr. 1/100 was tried as a possible substitute in a number of our cases with encouraging results. My own opinion is that for purposes of war economy the use of atropine, scopolamine, etc., should be discontinued except in cases where ether is going to be used.

4. Dr. Jarman asks—Why not advise for the giving of extra oxygen a "suitable" apparatus such as a McKesson or improved Boyle with dry flowmeters? Is it possible that he has missed the point that the modern conception of oxygen therapy does not consist in the administration of a few sporadic whiffs of oxygen in the theatre, but in the continuous administration of oxygen according to the patient"s requirements pre-operatively, during operation, and post-operatively, until the patient is well on the road to recovery? Is it Dr. Jarman's experience that the McKesson or Boyle apparatus is usually and readily available for continuous ward use? Further, he surely cannot have meant to suggest that a McKesson or Boyle apparatus is as well adapted as the B.L.B. type of mask to the comfort of the patient in continuous ward use.

Mr. Stanley Hillman's method (January 10, p. 56) is excellent in ordinary cases. I have used it for preference on many occasions, and I still do so, but not in grave abdominal cases—the subject, it is necessary to repeat, of our article. In such cases, to sit the patient up and to administer a subarachnoid high spinal block from "nipple to toes" would put a grave strain on his cardiovascular system and invite fatal results.

We are not perhaps the persons best qualified to discuss the possible complexity of our technique. In order to inject the second side of the splanchnic area we do not move the patient. He is placed with his back right at the edge of the table while the anaesthetist sits on a fairly low stool, thus enabling the manœuvre of injecting the lower side to be carried out with comparative ease. This technique was acquired with the minimum of practice, and it may be that the impression of complexity is conveyed by the difficulty of description.

I in large measure agree with Mr. Lang Stevenson's letter (January 31, p. 162). We did not purport to deal with zonal methods of subarachnoid spinal anaesthesia ; the omission was dictated by considerations of space. Even in this method, however, there are certain disadvantages. It is not well adapted for use in the case of an obese patient or a case of protruding abdominal viscera. With both of these types of case I have had frequent occasion to deal.

In conclusion, may I add that the nearest approach to the ideal anaesthetic for grave abdominal cases in the light of our present knowledge is obtained by means of the safest and most suitable form of regional anaesthesia combined with an appropriate form of light general narcosis. Only thus are the conscious and subconscious centres protected. This principle, originally propounded by Crile many years ago, formed the basis of our article. The actual technique involved is of secondary importance.—I am, etc.,

Twickenham, Middlesex. N. R. JAMES.

The Back-pressure Kidney

SIR,—About five years ago I began a paper on excretory urography in patients with prostatic enlargement, but for various reasons laid it aside. At that time papers had appeared on the subject by Kraus, Herman and Kraus, Prather and Brodny, Braash, and Troel. Von Lichtenberg had also commented on the matter. These papers showed a difference of opinion.

Prather and Brodny concluded that there was meagre evidence as to the frequency of upper urinary dilatation in prostatics, and that in the majority of patients seen in hospital this dilatation and poor renal function did not coexist. They also stated that one should not assume that poor renal function is merely due to back-pressure. These views were based on a series of intravenous pyelograms in thirty-five patients with prostatic enlargement and on thirty-three post-mortem examinations in patients whose deaths were primarily prostatic in origin. This paper was a contradiction of the views of the other writers with the exception of Braash, who evidently reserved his judgment. His finding that small amounts of residual urine, 100 c.cm. or less, do not seem to produce dilatation appears significant.

I studied about fifty cases. Preceding drainage and infection complicated the matter. My impressions, however, were in agreement with those of Kraus. I found impaired renal function and upper urinary tract dilatation almost always, if not always, associated. As a result of these observations I made it my routine to have intravenous pyelograms made in hospital patients with prostatic trouble. It was interesting to note how well the upper urinary tract recovered after a period of drainage. I certainly am disposed to accept the obvious proposition that renal failure, in the absence of infection, cannot occur until adequate peristalsis fails in the ureter. It is difficult to believe that each half of the prostate may produce its effect on the homolateral ureter.

I am not prepared to say that pyelograms showing an undilated upper urinary tract prove good renal function, for I suppose a sufferer from chronic nephritis is not thereby prevented from developing an enlarged prostate. I do believe, however, that there can be no denying the importance of adequate watertight ureteric peristalsis when prostatectomy has to be done.—I am, etc.,

Birmingham. HUGH DONOVAN.

Hypertrichosis and Acne

SIR,—If Dr. R. Greene (January 10, p. 54) and Dr. A. W. Spence (January 31, p. 162) had given themselves the trouble to read more carefully the report of my Thomas Vicary lecture, the discussion which has followed would have been on a more precise plane. In that part of my lecture describing the historical development of the treatment of intersexual conditions I pointed out that the semi-miraculous results of hormone therapy seemed at one time to centre the problem of intersexuality on endocrinotherapy, but, as said in the report, "these almost magical results do not justify the orgy of glandular injections given at random." My point was to show that in the treatment of intersexual conditions we have passed from the exclusively endocrinological to the constitutional or biological outlook.

Thus, I have never said that hypertrichosis or acne can be cured by a special hormone. My contention is that both these afflictions are simply local manifestations of a general neuro-humoral disturbance which differs for each patient; and that treatment of this basic disturbance (which does not exclude local treatment) contributes to their cure. The clinician of to-day does not treat Greek labels, but the whole patient independently of his label. The modern clinician is like an archaeologist who has to dig deeper and deeper into the body-mind to find the source of evil. I regret that Dr. Spence does not understand these principles of constitutional medicine, but I can assure him that they can be grasped by anyone who gives himself the

trouble to read the important works published on the subject in England, America, Greece, and other countries, and to visit personally the leading clinicians practising medicine on these principles. The essential point in my Thomas Vicary lecture, which seems to have escaped Dr. Spence and Dr. Greene, who have merely seized on one sentence apart from its context, is that the historical approach is the only method of thinking in medicine. May I recommend to Dr. Spence the cultivation of this approach? It will enlarge his outlook, and show him that endocrinology does not consist only in trying one hormone after another on cases insufficiently diagnosed constitutionally. It will help him to understand the medicine of the whole man and to offer a sound basis for scientific discussion.—I am, etc.,

London. W.1. A. P. CAWADIAS.

*** This correspondence is now closed.—ED., *B.M.J.*

Spinal Anaesthesia

SIR,—In the *Journal* of January 31 two contradictory opinions are expressed on the safety of the use of spinal anaesthesia: (1) in the article by Dr. W. W. Mushin, who says (p. 140) that spinal anaesthesia "is never used for ill, debilitated, or shocked patients"; (2) in a letter by Mr. Lang Stevenson (p. 162), who says that this form of anaesthesia "is one of the safest, most efficient, and simple to administer." In support of this view he describes its use in a case, typical of the "poor risk" patient.

In the paper by Dr. N. R. James and Mr. H. W. Burge (December 27, p. 906) it is stated that "spinal anaesthesia is unsafe except in comparatively fit patients." Mr. Stanley Hillman (January 10, p. 56), criticizing this article, states as his opinion that "there is no better anaesthesia than spinal anaesthesia using 1 in 1,500 percaine by the Etherington-Wilson technique," and that he "rarely considers a patient unfit for the method."

Here are two definite opinions contraindicating the use of spinal anaesthesia in "poor risk" cases and two opinions advocating this form of anaesthesia in such cases. Since the first consideration of any anaesthetic technique must be the safety of the patient, one would welcome the opinions of many of our leading anaesthetists on this question. How would a candidate for the D.A. fare at the hands of the examiners were he to recommend as the method of choice spinal anaesthesia for the elderly, markedly cachectic lady suffering from an advanced carcinoma of the caecum mentioned by Mr. Lang Stevenson?—I am, etc.,

Salisbury. A. D. H. SIMPSON.

SIR,—I feel impelled to write again and challenge another statement which I see made on, I am sure, quite inadequate grounds. I refer to the opening sentence of the article by Dr. Mushin on heavy percaine spinal anaesthesia (January 31, p. 139), in which he says: "Hypobaric or light solutions for spinal anaesthesia are losing their erstwhile popularity." I would ask Dr. Mushin on what grounds he makes such a statement, and has he any real proof, outside his own immediate circle, that so sweeping a statement is true?

Dr. Mushin states that such techniques as the three recognized ones for using hypobaric percaine, though excellent in expert hands, are complex, and failure easily results if details are neglected. I have used the Etherington-Wilson technique for seven years, and can claim over 3,000 cases, and I maintain that it is by far the simplest and least complex of *any* method—far less so than the method for heavy percaine which Dr. Mushin then goes on to describe. Dr. Mushin complains of the need for attention to detail in using the hypobaric methods, yet states: "As in any form of spinal anaesthesia, safety in this series was ensured by attention to the following points"; he then gives five points, including "(3) a careful and constant technique." Is his opening criticism therefore very fair?

After reading all the instructions and the different posturings of the patient I am all the more convinced that the heavy percaine method has nothing to commend it over the Etherington-Wilson hypobaric method; in fact, it is far more complex. Furthermore, Dr. Mushin himself does not recommend the method for upper abdominal work, where, I maintain, the hypobaric method is ideal for difficult partial gastrectomies and all work under the diaphragm. I agree with the use of a fine needle, but I do not agree with not anaesthetizing the skin and track of the puncture; nor do I think the holding of the needle by the hilt calls for accuracy, but will, on the other hand, result in many bent needles and loss of accuracy. The spinal anaesthetist should wear gloves, and so be not afraid of holding his needle near the point at the first introduction and in that way get accuracy and freedom from strain on the needle.

I am an ardent user of spinal anaesthesia for, as a surgeon, I feel both my patient and myself suffer the least trauma that way, and if anyone can show me a better method than the Etherington-Wilson technique for hypobaric spinal anaesthesia I will gladly adopt it, but as yet I have not seen or read of a better. A prejudice against spinal anaesthesia has been raised by inaccurate statements repeated by those taken to be authorities, and it is a desire to see fairness in the statements of published articles that has impelled me to write again.—I am, etc.,

Portsmouth. O. STANLEY HILLMAN.

Infective Hepatitis

SIR,—The description of an epidemic of infective hepatitis by Dr. J. L. Newman (January 17, p. 61) is of considerable interest as it occurred in West Sussex immediately after a similar epidemic in Ryde in the Isle of Wight lasting from December, 1938, until June, 1939. My assistant, Dr. Harold Brannan, and I attended about 150 cases during that period, and most of them, like Dr. Newman's, started with abdominal discomfort, vomiting, pain and tenderness in the right subcostal area, followed within a few days by jaundice, which varied from slight staining of the conjunctivae to generalized light pigmentation. The diagnosis was invariably confirmed by the presence of bile in the urine.

The cases were at first practically all in children attending the council schools, although later on in the epidemic adults were affected. We did a considerable number of white blood counts, but they were varied, the average being 7,000, the highest 12,000, and the lowest 4,400. We also obtained specimens of blood and washings of the throat from a number of the cases, and these were sent to Dr. G. M. Findlay of the Wellcome Bureau of Scientific Research. The only point of interest that arose therefrom was that in two cases rhesus monkeys which were given the blood by stomach tube showed short febrile rises lasting forty-eight hours on the fifteenth day after feeding. Attempts to "passage" the condition in monkeys failed. Dr. Findlay had had similar experiences with blood from catarrhal jaundice cases. Results with guinea-pigs were negative.

One patient had rather unusual symptoms. On April 5, 1939, he complained of vague pains in his right hip. On April 6 he had pain in his abdomen and appeared dazed and stupid. On April 7 he was definitely showing signs of jaundice pigmentation and had bile in the urine. He became delirious and had to be restrained. His reflexes were then normal, but on April 10 he developed a positive Kernig's sign on the right side and was admitted to hospital. Lumbar puncture revealed increased pressure of the C.S.F. but no other abnormality; bile was absent and cultures were sterile. The pathologist reported no evidence of Weil's disease. The patient had a white blood count of 12,400. He recovered uneventfully. His brother, who had been under observation because of a complaint of headaches and listlessness, started vomiting on May 7, 1939, and developed definite pigmentation of the skin on May 8. Dr. Findlay inoculated his blood intracerebrally into mice, but without result. From this family history it would appear that the incubation period of the disease is about thirty-two days, although in some it was as low as twenty days.

I feel that this epidemic may have been the original source of infection of Dr. Newman's, as there is a likelihood of some cases having gone to the Chichester district.—I am, etc.,

Ryde. THOMAS SIM.

Reactions after Blood Transfusion

SIR,—The value of blood transfusion is minimized by the reactions, and fear of reactions, which occur after the use of Group O blood. These reactions, which occur in about 10% of cases, are probably due to the high titre of agglutinins in the sera of some so-called universal donors. Such reactions are more likely to take place in the aged and those suffering from blood diseases, but, broadly speaking, blood transfusion from nine out of ten donors is safe.

Would not reactions be much lessened if Group O blood were pooled on the day of the "bleed" and immediately separated

off in pints after mixing? Each bottle would then contain the blood from several different donors, and this would diminish the danger of using Group O blood of very high agglutinin content from any single individual.—I am, etc.,

Newport, Mon. J. T. RICE EDWARDS.

"Ether Convulsions"

SIR,—Any fresh fact relating to ether convulsions is, I think, worthy of record. I have seen several cases of this alarming complication of anaesthesia, but none in which, as in the case about to be described, there was a previous history of heat-stroke.

The patient, a man of 30, was suffering from a perforated gastric ulcer of eight hours' duration. He was in a toxic condition. Omnopon 1/3 grain was given when the diagnosis was established, followed by atropine 1/100 grain. Induction was uneventful, Boyle's apparatus and gas, oxygen, and ether being used. As the peritoneum was being opened, twitchings started in the facial muscles and rapidly spread throughout the body. Cyanosis was marked. Ten c.cm. of evipan had to be given before the convulsions ceased. The rectal temperature was then taken and found to be 106.2° F. The operation was completed uneventfully and the patient returned to the ward, his temperature then being 105.2° F. This was reduced in an hour, by ice-packs to the head and neck, to 102° F. The theatre temperature during the operation was 81° F., and the patient had been covered by heavy mackintoshes. He made a good immediate recovery from the operation, and with a view to the avoidance of a possible repetition of his convulsions he was informed of the occurrence. He then volunteered the fact that some years before he had had a heat-stroke, and that all his life he had been unduly susceptible to heat. Unfortunately he developed a subphrenic abscess and died a month later. At the post-mortem examination multiple cerebral abscesses were found, but these were probably due to septicaemia.

It would be interesting to know whether sensitivity to heat has been previously noted in a case of ether convulsions, and as a prophylactic measure it would seem advisable to abandon the use of mackintosh coverings in all acute septic cases. Furthermore, does the fact that evipan or pentothal stops the convulsions apply also to their use during induction of anaesthesia? After a close study of the literature I have been unable to find a report of ether convulsions occurring after such an induction.—I am, etc.,

London, W.1. MASSEY DAWKINS.

Increase of Tuberculosis

SIR,—If the medical profession as a whole accepted and acted on the statements made by Dr. V. S. Hodson (January 17, p. 89) a retrograde step would be taken, and we could hope for nothing but a fresh rise in the incidence of the disease. It appears impossible for the champions of the endogenous and exogenous reinfection schools to compromise and accept the fact that both methods of reinfection occur, a conclusion reached by many tuberculosis workers as the result of a careful study of the disease in all its aspects in the field. We also recognize that primary infection in adult life can result in active disease within a short period, and that in rural areas, where by no means all adults are tuberculin-positive, such cases are relatively common and are usually of the fulminating type, though small numbers of the hilar gland type with retrograde lymphatic spread occur in all parts of this country, more frequently in some areas than in others.

As believers in the dual theory of reinfection, we recognize that the majority of isolated cases of pulmonary and non-pulmonary disease in adult life are caused by lowered individual resistance with resulting endogenous reinfection; but most of us could cite more than one instance of a chronic phthisis infecting a series of fellow workers in a comparatively short period of time—surely an example of exogenous reinfection. By what other method than exogenous reinfection, too, can we account for the multiple cases in susceptible families where the primary case breaks down after all have reached adult life, and where, in the absence of any of the usually accepted factors causing lowered individual resistance, the remainder of the household succumb to the infection within the space of two or three years? The only members of the family to escape in many of these cases are those who have married and set up house elsewhere, and who have not, therefore, been exposed to the massive infection to which the others have been subjected.

On the question of marital infection I must also disagree with Dr. Hodson, as some years ago I picked out case-sheets of 400 patients who had died of open pulmonary disease ten years before the date of the investigation, and found sixteen cases where the spouse had developed the disease in the same area during the intervening period, and as some would have left the district the figure of 4% arrived at is probably on the low side. Even 4%, however, is a much higher figure than that for married women in the same age groups not exposed to household infection. As an extreme instance, I might mention one patient with fibroid phthisis who had lost three wives from the disease in less than fifteen years, none of these having any history of contact with the disease before marriage. To accept all three as cases of endogenous reinfection is surely stretching the long arm of coincidence a little too far.

If, then, one accepts the fact that both types of reinfection occur, and that disease is possible as a result of primary adult infection, it is obvious that many factors are now contributing to the increasing incidence. While lowered individual resistance as a result of increased strain is probably the greatest of these, black-out conditions with their lack of ventilation and warm humid atmosphere and overcrowding in shelters also contribute their share. It behoves us, therefore, to carry out all our present measures for control of the disease even more energetically than before if the increase is to be prevented from reaching disastrous proportions.—I am, etc.,

Woolcy Sanatorium, Northumberland. A. SCOTT.

SIR,—The letter from my friend Dr. V. S. Hodson (January 17, p. 89) seems to me to demand a brief answer. Dr. Hodson has raised one of the most difficult points in the whole range of tuberculosis. I am convinced that the reinfection of persons from open cases and carriers frequently takes place, and could quote instances which appear to me to bear no other interpretation. This form of argument is, however, of no use, because the believer in endogenous reinfection can always suggest that the individual has undergone some strain or other which has been quite enough to account for his breakdown. As one of those who believe in both endogenous and exogenous reinfection, may I be allowed to quote two observations of recent date which seem to me to bear on the matter.

The first is by Robert E. Plunkett, General Superintendent of Tuberculosis Hospitals, New York Department of State. Under the title of "Tuberculosis among Selective Service Men in New York State," he writes, in *War Medicine*, September, 1941, as follows:

> "For the purpose of this investigation the inmates [of the State School for Mental Defectives, Newark, N.Y., 2,300 in number] have been classified into two groups: (1) those who at some time since February, 1936, have been in contact with the active reinfection types of pulmonary tuberculosis in the same ward, and (2) those who have not been in contact with tuberculosis. The data collected so far seem to indicate that in every new case of the reinfection type of tuberculosis which has developed among the patients there has been a history of a case of active infection in the immediate environment at some time. On the other hand, among inmates who at no time have been associated intimately with a patient with an open infection not a single new case of reinfection has been observed."

This observation, whilst striking, represents of course the events inside a mental home and implies a sort of intimacy which seldom takes place outside; but it suggests that the exogenous reinfection of adults is fairly common.

There is also a recent paper by H. J. Anderson, Fort Qu'Appelle Sanatorium, Saskatchewan, in the *Canadian Public Health Journal* for December, 1941 (**32**, 594). He studied "345 family contacts with tuberculosis lesions," a number of these being of childhood age. He writes:

> "Of the 345 cases studied 62.4% were discovered during the first year after breaking contact; 14.6% in second year; 7.5% in third year." (84.4% were discovered in the first three

years.) "The monthly incidence in the age group of 20-24 years is high, but we find that family contacts account for only 21.3% of the cases in this group. This is the reverse of what one would expect to find if childhood infection were a major factor in contributing to young adult breakdown."

I must apologize to you, Sir, for having inadvertently caused such a great deal of space to be occupied under this heading, but the matter is of the most intimate importance with reference to the recruiting for the Navy, Army, and Air Force.—I am, etc.,

S. LYLE CUMMINS.

SIR,—If I may be allowed to reply to the critics of my letter (January 17, p. 89) I should like to point out that they have dealt with only one aspect of tuberculosis.

Dr. Hall (January 31, p. 162) bases his opinion of the infectivity of marital cases on presumption, which is always rather a flimsy foundation for an argument. Even before the tubercle bacillus was discovered observers had noted the rarity of the occurrence of cases of marital infection.

I sympathize with Dr. Rose Jordan (p. 163) in having a fixed belief disturbed, but the efforts of workers against the spread of tuberculosis will be more effectual if their efforts are based on a correct understanding of the disease. Her reliance on an incubation period of anything from one to twenty-nine years makes me suggest that a more general study of the seed and soil aspect of tuberculosis would prove enlightening, and might, perhaps, make Dr. Jordan's assurance less pronounced.

Dr. Wallace (p. 163) takes me to task for suggesting that public health authorities have little right to claim credit for the improvement in tuberculosis figures since 1870. As the decline in the tuberculosis rate started definitely and long before tuberculosis officers and their allies existed, and continued year by year, it does not seem to me unfair or illogical to judge that some other agency was responsible for the improvement. I prefer to believe that the change for the better was due to improved social and economic conditions. The improvement continues nowadays, aided and increased by the protection of infants and children from home infection. The fact that the decline in the tuberculosis rate was disturbed in 1914-18 and is now also interfered with seems to support the view that war stresses and strains are producing cases in those already infected, and that contact with known or unknown cases has nothing to do with the development of the disease from the dormant to the active stage. Dr. Wallace gives agreement, even if it is qualified, to the endogenous origin of adult tuberculosis in this country, so that, in fact, he should agree with all the points I have raised, because the thesis I put forward depends wholly on that explanation of all the various forms of adult tuberculosis. As to sharing a bed with an advanced productive case of phthisis, I should personally not choose such a bed companion, not from fear of infection, or rather the bogy of infection, but for aesthetic and humanitarian reasons.—I am, etc.,

Southwater. V. S. HODSON.

Wounding Mechanism of High-velocity Missiles

SIR,—I hesitate to occupy your space with a controversy which can be of little interest to the majority of your readers, but such a direct attack as is contained in Mr. Welbourn's letter (January 17, p. 89) calls for an answer; may I, as the engineer of the research group, provide it. I am, of course, familiar with the stress-wave theory Mr. Welbourn mentions, and indeed share with him the advantage of Mr. Landon's teaching.

Contrary to his suggestion, it is not true that our results could have been simply and certainly forecast by stress-wave theory. The ordinary theory applies only to distortions small compared with the size of the specimen; furthermore, the very large number of internal reflections of stresses which must have occurred by the later stages of the "explosion" make the problem of determining the distribution of stresses at this period quite intractable. Mr. Welbourn appears to think that the problem can be considered as one of motion of the particles radially outwards from the track of the projectile; but this is far from being the case, as can be seen from our photographs. In confirmation of this I might add we have had the advantage of the advice of a distinguished mathematical physicist who has made for us an approximate theoretical investigation covering the initial distortions only. His results show that the surface velocities in the direction of the motion of the projectile are greater than the radial ones. Further work is in progress on the comparison between his results and the experimental ones.

Another fundamental barrier in the way of theoretical forecasts is the fact that, as Mr. Welbourn says, "an accurate knowledge is required of the physical properties of the material." This knowledge is not, as he implies, easily obtained; on the contrary, even as regards slow speeds it is hard to come by in the case of materials like flesh and bone, which vary considerably from individual to individual. Since the strength of gelatin as measured at slow speeds is evidently different from that at the high speeds of our tests, as was stated in our paper, we would have to measure the properties of the materials at high speeds; these experiments would be considerably more difficult to perform than those reported in our paper. Furthermore, even if there did exist a well-developed theory covering this field, experiments would still be needed to confirm the theoretical deductions.

We are, of course, well aware of the beautiful technique of Ehrke and Slack in high-speed *x*-ray photography; and indeed we are in contact with them.—I am, etc.,

Oxford. A. N. BLACK.

Aetiology of Disseminated Sclerosis

SIR,—Since this disease was first described a little over a century ago numerous ideas of its causation have been put forward by different workers. Much research has been carried out with the object of elucidating the problem. So far nothing conclusive seems to have been proved, though many interesting facts have come to light during these investigations. Sometimes it has appeared that a particular line of research was yielding information so valuable that the goal would almost certainly be reached within a short time, but abruptly came a deadlock, and no further advance alone that line seemed possible. Even more strange, perhaps, was the fact that other investigators working along different lines reached the same point, and again came the deadlock. Some of these workers summed up the situation in these words: "Various agents, viruses, chemical substances, bacteria, etc., can cause demyelinization, some by direct action, others by causing blood to clot more readily, giving rise to thrombosis followed by demyelinization. It is probable that endogenous susceptibility of a quite unidentified kind must play a part, for these demyelinating conditions occur only rarely, and it is possible that allergy may be concerned in the production of the vascular lesions." Endogenous susceptibility may well prove to be some quite obvious condition—so simple that it may have escaped the notice of research workers for that very reason. It may be something that lies more in the province of the clinician than in that of the experimental workers.

The recent advances in vitamin therapy with the inevitable spate of advertising literature have resulted in the trial of some form or other of a vitamin preparation in almost every disease, acute or chronic. Disseminated sclerosis has not escaped; vitamin B has been tried in a number of cases, and some observers, perhaps a little more optimistic than others, have claimed symptomatic improvement. This form of treatment appears to have been initiated chiefly because certain other nervous diseases respond to vitamin therapy. The diseases which have shown definite improvement or cure, however, were those in which a vitamin deficiency was the underlying cause of the morbid condition. Defective absorption by the alimentary canal or deficiency in the diet were the obvious factors involved. Many observers in recent years have felt that disseminated sclerosis may yet prove to belong to this deficiency group. It seems a pity to treat any disease empirically when the possibility of amelioration of symptoms or arrest of the course of the disease could be finally decided by relatively simple research into the alimentary functions and vitamin absorption of a series of these cases.

Within the last few months thirteen cases of disseminated sclerosis have come under my notice, and of these only four had any free hydrochloric acid in their fractional test meal; the remaining nine were achlorhydric. All the cases were ambulatory with the exception of one patient who was confined to

bed. They were apparently in good health apart from the disability due to the disease, and almost every one belonged to the 20-30 years age group. Admittedly coincidence may have played an abnormally large part in this very small number of cases. In a large series obviously coincidence could play only a minimal part, and a much truer picture would be presented. It should be easy for a number of workers to obtain accurate information on this point.

If it should turn out to be true that the gastric secretion is deficient in a considerable proportion many interesting questions will arise. The first would obviously be: Is the deficiency responsible for the onset of the disease, or can it have arisen during the course of the disease owing to involvement of the nerve supply to the stomach? How does the vitamin absorption compare with the normal? Does the administration of hydrochloric acid by mouth help in the absorption of vitamins given at the same time and in the same way?

Disseminated sclerosis is such a widespread disease that it should be an easy matter to obtain accurate information on these points, and the information so gained may possibly point the way to further research or even throw some light on the aetiology of the disease.—I am, etc.,

EILEEN M. HICKEY, M.D.,
Belfast. Senior Physician to Mater Infirmorum Hospital.

Derris-root Treatment of Scabies

SIR,—In response to Captain Leslie Saunders's letter (January 24, p. 127) I wish to add my testimony to the efficacy of the derris-root treatment of scabies. During the past three months I have employed this method exclusively in my dermatological clinic, using 4 oz. of derris root to 1 gallon of water, with the addition of 18 drachms of soft soap. One application daily is made following a bath (I intend to try the omission of the bath, as this may be of importance should there be a recrudescence of air raids and "shelter life"). Treatment is continued for three days. I think this to be necessary, as the ova take three days to hatch, so that shorter treatment may result in some acari escaping destruction. As an extra precaution both clothing and bedding are disinfected after the treatment is completed.

Out of my first fifty cases there have been three failures. The first relapsed three times, until other members of the family were brought under treatment. I now try to insist that all in the house receive treatment at the same time, whether obviously infected or not. The other two were twins, and resisted all forms of treatment; it is probable that here the diagnosis was at fault and that the lesions were due to lichen urticatus.

There has been no dermatitis, nor have I had any complaint of the burning sensation of the skin and scrotum reported by some observers. In conclusion this method is cheap, clean, and efficacious.—I am, etc.,

Southsea. A. MURRAY STUART.

Severe Rubella

SIR,—Surgeon Lieut.-Commander Vincent-Smith (January 31, p. 165) raises the question of the possibility of a severe type of rubella. I have no knowledge of outbreaks of this disease on virgin soil, but in 1940 an epidemic of rubella occurred in this area, and, I believe, in many parts of the country, which in some ways differed from my previous experience of that disease.

A number of my patients had severe sore throats and were far more ill than I expected them to be. These cases, I am convinced, were not mistakes in diagnosis for scarlet fever. They had enlarged occipital and cervical glands and occurred in households where other members of the family had "ordinary" attacks of rubella.

In one case a child of 4 had a temperature of 103° F. for a week, a most intense irritating rash which persisted for the whole week, and was so weak and ill that it was difficult to believe in a diagnosis of rubella. This child had enlarged occipital, post-auricular, and cervical glands, no sore throat, and a clean tongue. Eighteen months later he had a typical attack of scarlet fever. Another child I have seen more recently developed a temperature of 104° F. with rubella.

A large number of cases in the 1940 epidemic were affected by a transient arthritic pain and stiffness in the wrists (particularly) and other joints, which in all my cases passed off in a week or ten days. There were numerous reports at the time of arthritis and sore throats accompanying rubella, and I have a recollection of a report from a medical officer in France of a number of severe cases occurring among the troops.—I am, etc.,

Tewkesbury. F. B. P. EVANS.

Hemiplegia as a Complication of Diphtheria

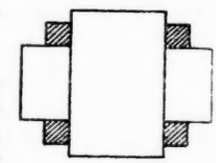
SIR,—With regard to Dr. I. A. G. MacQueen's case (January 31, p. 149) the literature, including my own experience (*Clin. J.*, 1940, **69**, 67), shows that cerebral embolism is the commonest cause of hemiplegia in diphtheria, as it was found in twelve out of twenty necropsies, sometimes associated with renal or splenic infarction, of which I have seen a few cases. Embolism appears to be commoner in diphtheria than in any other acute infectious disease, being due, as Marfan has pointed out, to a mural endocarditis of the apex (see also Rolleston, J. D., and Ronaldson, G. W., *Acute Infectious Diseases*, 3rd ed., 1940, p. 34).—I am, etc.,

Kensington, W.8. J. D. ROLLESTON.

Reduction of Time Lost through Vaccination

SIR,—I think that the following method of reducing the number of days lost in training is of considerable interest and importance, and at the moment of national importance, as men must get through their initial training with the maximum speed possible, every hour of which counts.

I get 300 to 400 men to vaccinate every two weeks. These are inspected for the result on the seventh day. At the same time as inspection I loosen the blister with a sterile scalpel and then apply an acriflavine emulsion dressing, using a small piece of lint well soaked. I apply the adhesive tape like this:



The patient then carries on his normal duties, attending for dressing just when he thinks necessary.

The result of two batches is as follows: number off duty for an average of two days—first = 1.5%; second = 3%. Previously the blister was not interfered with, and the average number off duty for two or more days reached consistently the appalling figure of 20%. The reduction of this 20% to about 2% is surely of great importance to the Army.—I am, etc.,

B. DAMER MERRIN,
Captain, R.A.M.C.

Medical Studies in London

SIR,—Is it not time that anatomy was once more taught in London? From such inquiries as I have been able to make I find that the Medical School of St. Mary's Hospital is the only one which has retained its staff in London to teach this subject. There may or may not have been good reason for the flight of some teachers to the Provinces at the outbreak of war; but, if the fear of the effect of the bomb is one of the causes of this migration, experience has now shown that provincial cities are no more immune from air raids than any other part of England.

The London medical student of to-day is having a raw deal. For his pre-clinical studies he is sent to the Provinces. On taking up his clinical work he cannot settle down in one hospital, but is expected to travel from one institution to another in his E.M.S. sector to acquire scraps of knowledge. No attempt whatever, with few exceptions, is being made to organize clinical teaching in our L.C.C. hospitals, where there is still a wealth of clinical material. These are centrally situated, whereas most of the E.M.S. hospitals are in the country. Has it occurred to those who control medical studies in London that the student is being put to considerable expense and waste of time by the present arrangements?—I am, etc.,

London, W.1. CLIFFORD MORSON.

Economy of Medical Man-power

SIR,—The suggestion by Mr. H. J. McCurrich (December 6, p. 826) that the D.A.D.M.S. of a Division might be replaced by an A.T.S. officer displayed most complete ignorance of the duties of these important medical staff officers. He appeared to think that a D.A.D.M.S. is merely a sort of head clerk, and failed to realize that he is the deputy of his A.D.M.S., and,

as pointed out by your correspondent, "A Former D.A.D.M.S." (January 10, p. 52), may have to issue operation orders for his A.D.M.S. in an emergency.

In addition to his staff duties, which, like the duties of his chief, the A.D.M.S., always have a medical flavour, the D.A.D.M.S. has executive medical duties to perform. The headquarters of a Division includes a large number of officers and other ranks, and not the least exacting of the duties of a D.A.D.M.S. is to act as staff surgeon to this important group of persons. For these executive duties during static warfare an M.I. room has to be organized, and during active operations the D.A.D.M.S. is provided with similar medical and surgical equipment to a regimental medical officer. The medical and surgical eare of a general, of several senior and many junior officers, and of a large number of N.C.O.s and men is no sinecure and taxes the ingenuity and professional skill of every D.A.D.M.S.

It is a pity that your correspondent did not consult some officer of experience before rushing into print with yet another suggestion as to saving R.A.M.C. officers. The military medical authorities, from the Director-General downwards, are fully alive to the need for conserving medical man-power, and are co-operating through the Shakespeare Committee and the Regional Committees in the efforts to ensure economical use of all medical personnel.—I am, etc.,

R. J. BLACKHAM,
Major-General.

Obituary

The death occurred on January 26, after a very brief illness, of Dr. KATHLEEN WILSON of Chapel Allerton, Leeds. She came of a well-known local family, and after completing her education spent a year in Canada and the United States, returning home in 1914. She then went through a course of training in midwifery and took the certificate of enrolment of the Central Midwives Board, and served in France with the Friends' Maternity Unit. The insight into medical problems gained during this period led her to begin the study of medicine at Leeds Medical School in 1916. After obtaining the degrees of M.B., Ch.B. Leeds, she was appointed house-surgeon and later resident obstetric and gynaecological officer at the General Infirmary. Afterwards she undertook general practice, and combined with this appointments in maternity and child welfare, industrial medicine, anaesthetics, and more recently in civil defence work. She had frequently travelled abroad, and during last year undertook the journey to Canada as medical officer in charge of children evacuated under the auspices of the Children's Overseas Reception Board. But no account of Dr. Wilson's appointments would be complete without reference to her work for voluntary associations in Leeds. To these she gave unstintingly of her time and interest, and for the present it will not be possible to replace her. While the practice of medicine was her chief concern, Dr. Wilson's interests were very wide. She was a past-president of the Yorkshire Association of Medical Women and of the Soroptimist Club of Leeds, and at the time of her death was president of the Leeds Division of the British Federation of University Women. She was deeply interested in music, languages, and art. She had a very wide circle of friends, and was a most generous and hospitable hostess. Because of her dignified bearing and personal charm she was an outstanding figure in any assembly. By her untimely death the medical profession in Leeds has lost one of its most capable and devoted members. She is survived by her sister, Dr. Harriette A. Wilson, and by two brothers.

Dr. CHARLES ERNEST GODDARD, who died on January 31 in retirement at Rottingdean, was for more than forty years medical officer of health for Wembley and an outstanding figure in the neighbourhood. He was born in Kensington on October 31, 1859, and had a brilliant student career at King's College and its hospital. He qualified in 1883, and many years later took the M.D. of Durham. His early appointments included a year as ship surgeon, R.M.O. at the old North London Hospital for Consumption at Hampstead, and many local posts in the Harrow, Wembley, and Hendon areas. He started at Wembley in the only practice there. As a health officer, at first part-time and later whole-time, Dr. Goddard's dynamic personality made itself felt in many directions, and his concern for the purity of milk and other food was expressed in no uncertain way by word of mouth and in written reports. During the last war he was called up at once as a major, R.A.M.C. (T.A.), in command of the 2nd London Sanitary Company, and took 320 men to France, distributing them to the divisions already there, and himself commanded a sanitary unit at Ypres. On returning home Dr. Charles Goddard became successively president of the Chelsea, Holborn, and City of London medical boards, and was made a deputy commissioner of medical services under the Ministry of National Service. In 1923 he was medical officer of health for the British Empire Exhibition at Wembley; he held office as chairman of the Harrow Division of the B.M.A. at that time, and again in 1932-3, having been a member since 1884. He gave up active work in 1936, after more than half a century of service to his fellow men. Of his five children the eldest son, Dr. Ambrose Goddard, joined him in partnership, and took over the practice when he retired from it in 1926. A correspondent writing in the *Wembley News* says that "Dr. Goddard's chief qualities were courage, dignity, and charm. Added to these, his considerable intellectual endowments made him a delightful companion. Very few people whom I have met had so complete a mastery over their feelings. In his long public career he was many times confronted with prejudice, ignorance, and self-interest when attempting to improve conditions; and though he could be boldly outspoken he never lost his self-possession. His temper was in restraint to the purpose he had in mind. He never lacked courage to do what he believed to be right. His charm was probably not so much a quality as a combination of qualities."

By the sudden death on January 31 of Dr. LIZZIE ROBERTSON CLARK at the home of her brother, Dr. Drummond of Coatsbridge, the medical profession has lost an outstanding personality. Left a widow in early middle life, she went in for medicine, qualified in the minimum time, and decided to devote her professional career to tuberculosis. She joined the staff of the Welsh National Memorial Association as senior resident medical officer at Glan Ely Hospital, Cardiff, in 1920, later became an assistant tuberculosis officer, and in 1927 was given her great chance by promotion to the post of medical superintendent of the Adelina Patti Hospital, Swansea Valley. She retired in 1937. Such (writes D. A. P.) are the bare facts of her career. Behind them, however, lies a life rich in achievement and brimming over with well-doing. Already an expert on the clinical side, widened by experience on the Continent and elsewhere, she displayed as medical superintendent quite exceptional administrative gifts. Possessed with demonic energy, an indomitable will, and a flair for getting things done, she soon justified a somewhat venturesome appointment, and, overcoming many difficulties, transformed a rather humdrum institution into a hospital of the very first rank. When chided —as she often was—in exasperated admiration as the most unscrupulous (if selfless) of women, she might have the grace to blush, but had far too much good sense to reform. With it all, "our Lizzie" was full of fun; not for her the tight-lipped austerities—and asperities—of the dedicated life; she had no use and no need for such adventitious aids to authority. Adored by patients and staff, who courted her smiles far more than they feared her frowns, her greatest triumph was the wholehearted acceptance as one of themselves by her male colleagues. To work with her was to love her; to love her was a liberal education.

The death is announced of Dr. JAMES DONALD RAE MONRO, who was in practice in Muswell Hill for thirty-five years. He graduated M.B., C.M. of Glasgow University in 1892, where he followed his father and brother, and subsequently studied in Vienna. He proceeded M.D. in 1901 and received commendation for his thesis. After a short period in Hounslow he started in general practice in Muswell Hill. His activities were numerous. He joined the British Medical Association in 1894, and was chairman of the North Middlesex Division in 1922. He had also been chairman of the North London Medical and Chirurgical Society; had served as a member of the Hornsey Borough Council; was police surgeon for many

years; and was connected with the Hornsey Central Hospital since its early days. On his retirement he went to live at Richmond, Surrey, where he died after a long illness, bravely borne. In his profession, which absorbed the greater part of his life and energies, Dr. Monro always gave of his best. His unfailing patience, courtesy, and clinical skill made him universally popular. In private life he was a discerning reader and a man of scholarly pursuits. He is survived by a widow and four children, three of whom have followed in his footsteps in the medical profession.

We regret to announce the sudden death of Dr. JOHN BRADLEY on January 31, following an operation, at the age of 65. Dr. Bradley received his medical education at the Mason College, Birmingham, the forerunner of the University, qualifying M.R.C.S., L.R.C.P. in 1899. He subsequently held resident appointments at the Jaffray and Queen's Hospitals, Birmingham. Since 1901 he had been in practice in Coventry, and at the time of his sudden illness was chairman of Coventry No. 1 Medical Board. A member of the B.M.A. for over forty years, he leaves a widow and one son, at present serving as major in the R.A.M.C.

Dr. ALFRED RUSSELL DARLEY, who died at West Haddon, Rugby, on February 1, was chairman of the Northamptonshire Division of the British Medical Association in 1927-30, and had been a member for fifty-three years. The son of Benjamin Guinness Darley, M.D., of Coolock, Co. Dublin, he was educated for the medical profession at Trinity College, Dublin, graduating B.A., M.B., B.Ch. in 1887 after taking the L.M. diploma of the Rotunda Hospital with a special certificate in gynaecology. He proceeded to the M.D. of Dublin University in 1892. Dr. Darley had been M.O.H. for Daventry, medical officer to the West Northants Joint Hospitals Board, medical officer and public vaccinator for No. 20 District of Northamptonshire, and medical referee under the Workmen's Compensation Act.

We regret to record the death last month of Dr. CHARLES HERDMAN NEWTON, who had practised for the past twenty-one years at Pitlochry. He was born in Edinburgh in 1891, and from Loretto School went to Cambridge University and thence to Edinburgh University, where he graduated M.B., Ch.B. in 1915. For the next four years he held a temporary commission in the R.A.M.C. At Pitlochry Dr. Newton was honorary surgeon to the L.M.S. Ambulance Brigade, certifying factory surgeon, and medical officer to three adjacent parishes. He joined the British Medical Association, and was president of the Perth Branch in 1940-1.

Medical Notes in Parliament

Medical Man-power

In reply to Sir Leonard Lyle, who asked whether Mr. Ernest Brown's attention had been called to the number of idle doctors in uniform and the shortage of medical men in civil life, Mr. BROWN replied on February 5 that all practicable steps to secure the economical use of doctors in the Forces and in civilian services were being examined by the Medical Personnel (Priority) Committee. Further co-operation between the medical branches of the three Services had been secured in accordance with the recommendations of the committee and of the earlier one presided over by Sir Arthur Robinson, thus reducing, without any loss of efficiency in the Services, the number of doctors required. A system of releasing doctors from the Services to civilian practice, where there were special reasons for this course, was already in operation.

Mr. MESSER, on the same date, asked Mr. Brown to ensure that, in the calling up of doctors, the medical staffs employed at factories should not be depleted to a level impairing efficiency. Mr. BROWN said that, before proposing a factory medical officer for recruitment, the Central Medical War Committee and its local committees satisfied themselves that suitable arrangements could be made for carrying on his work.

Sir LEONARD LYLE asked on February 4 how it was proposed in case of need to staff the Emergency Hospitals with medical men. Miss HORSBRUGH answered that emergency hospitals were provided with medical staff to meet such needs as could be immediately foreseen. Any exceptional pressure on a hospital would be met by transfers from other hospitals under plans worked out in advance, by calling on available practitioners whose names had been placed on a rota for that purpose, or by co-operation with Service medical establishments, or by a combination of such methods.

Outbreak of Gingivitis

Sir ERNEST GRAHAM-LITTLE reported on February 5 that hospitals in different parts of the country were receiving considerable numbers of patients, drawn from the civilian population and from the Services, suffering from a form of gingivitis, a precursor of scurvy. Mr. BROWN stated that there had been a considerable amount of infective gingivitis among the Services and some cases among the civilian population. The evidence that this condition was due to dietary deficiencies was far from convincing. There was some reason to think that it was purely infective. Potatoes, carrots, and turnips contained the vitamins necessary to protect against scurvy. He was not aware of any difficulty in providing these foods.

Report on Industrial Pulmonary Fibrosis

On February 3 Mr. D. GRENFELL, replying to Mr. Daggar, said that the Mines Department had studied the report and memorandum on industrial pulmonary fibrosis made to the Welsh National Memorial Association by two of its medical officers, and the Medical Inspector of Mines had discussed its recommendations with the authors and with the staff of the Industrial Pulmonary Diseases Committee. This was the committee responsible for the extensive researches into silicosis which had been going on in South Wales, and which were the subject of a report now in the press. The question of institutional treatment for sufferers from silicosis was closely bound up with that of institutional treatment for tuberculosis and other pulmonary diseases. He proposed to confer with the two sides of the industry in South Wales as soon as the report of the research committee was available.

Factory Medical Officers

In a reply on February 5 Mr. Bevin said that since the making of the Factories (Medical and Welfare) Order, 1940, the numbers of whole-time and part-time works doctors had increased by about 100 and 400 respectively. It had not so far been necessary to exercise the powers given by the Order to give directions for such appointments to be made. It was for the employer to select the doctor, but the arrangements had to be such as to satisfy the Inspector of Factories. In a very few cases the appointment proved unsatisfactory and the doctor had been relieved of his post. Generally speaking, the doctors appointed carried out the work well. No complaint from workmen's organizations regarding any of the appointments had reached the Senior Medical Inspector of Factories. There was substantial co-ordination of the work with outside health services. The importance of this was stressed in Departmental advice and otherwise.

Prevalence of Typhus

Mr. EDEN told Sir Francis Fremantle on February 4 that he would endeavour to arrange an exchange of information with the Soviet Government about the prevalence of typhus and other infectious diseases, both civil and military.

Medical Boards.—On February 3 Mr. TOMLINSON, replying to Mr. Messer, said that while cases of physical or mental unfitness could not invariably be detected, the medical boards did not, in general, pass men who were unfit for service, and he was not aware of any grounds for disquiet. The standards applied and the methods employed by the boards were contained in a code of instructions agreed with the Service Departments and approved by the Medical Advisory Committee.

Medical Inspectorate of Coal Mines.—On February 3 Dr. MORGAN asked the Secretary for Mines why there was only one Medical Inspector of Mines, who also acted as medical adviser to the Mines Department, and whether his Department would consider the immediate advisability of appointing at least four more medical inspectors. Mr. D. GRENFELL said that the Royal Commission on Safety in Coal Mines made certain recommendations on medical and allied services which would involve some increase in the medical inspectorate. These and many other recommendations of the Commission, which

were accepted in principle by the Government, were under consideration as a whole when the war broke out. It had not been possible under war conditions to complete examination of the field covered by the Commission's report, but he would consider Dr. Morgan's suggestion.

Expenditure on Animal Diseases.—On a Supplementary Estimate for the Ministry of Agriculture and Fisheries, discussed on February 4, Mr. PRICE said the expenditure of £133,000 for animal diseases was mainly for foot-and-mouth disease. Tuberculosis, Johne's disease, and mastitis also caused great losses yearly. He understood the Minister had a scheme which, from technical difficulties, could not for the moment be put into operation. Mr. TOM WILLIAMS, replying for the Ministry, said all milk premiums paid to farmers were intended to clear up tuberculosis. This was a slow process which he would like to see expedited. Mr. DAVID ADAMS asked if it was intended to make the tuberculosis examination of cows a public charge. Mr. WILLIAMS said the cost of examination was borne jointly by two bodies. He could not deal with the question on that vote.

Ministry of Health Estimates.—On February 4 a Supplementary Estimate of the Ministry of Health for measures in England and Wales to deal with casualties and disease and for other services arising out of the war was approved. There was no debate, and a protest against the delayed publication of the Ministry of Health annual report was ruled out of order.

The Services

R.N.V.R. OFFICER'S DECORATION

The King has approved the award of the R.N.V.R. Officer's Decoration to Surgeon Commander James Arthur Kerr, V.D., R.N.V.R.

CASUALTIES IN THE MEDICAL SERVICES

ROYAL NAVY

Surgeon Commander ERNEST ROBERT SORLEY, who is presumed to have been killed in H.M.S. *Barham* on November 25, 1941, was the youngest son of the late John Tower Sorley, M.A., and was educated at the University of Aberdeen, where he graduated M.B., Ch.B. in 1923. He proceeded M.D. in 1935, having taken the D.P.H. in 1928. He entered the Royal Navy as surgeon lieutenant in 1925, and served in H.M.S. *Malaya* in the Mediterranean and in the *Centurion* until 1928, when he was appointed to Plymouth Hospital. From 1929 to 1932 he was in the *Enterprise* in the East Indies, and for the next three years at the naval hospital at Bermuda. After a year at Chatham Barracks he was appointed to Singapore in November, 1936. He was promoted to surgeon lieutenant-commander in 1930 and to surgeon commander in March, 1936, and joined the British Medical Association in 1937.

Temporary Surgeon Lieut. ARTHUR ERSKINE SHERWELL, R.N.V.R., reported killed in action in H.M.S. *Barham* on November 25, 1941, was educated at the University of Bristol, where he won the Suple gold medal and prize in 1923. He qualified M.R.C.S., L.R.C.P. in 1923 and took the Bristol M.B., Ch.B. in the following year. He held the posts of resident casualty officer at Bristol Royal Infirmary, junior assistant medical officer at Barnwood House Mental Hospital, and house-surgeon at Warneford Hospital, Leamington Spa, before setting up in practice in Dagenham. A few months before the outbreak of war he moved to Stratford, and in February, 1940, entered the R.N.V.R. as temporary surgeon lieutenant. He was the husband of Dr. Mary E. G. Sherwell (*née* Wilkinson). He had been a member of the British Medical Association since 1937.

Probationary Temporary Surgeon Lieut. ANTHONY RICHARD BARRETT, R.N.V.R., is included as "Missing, Presumed Killed" in an Admiralty Casualty List published on February 4. He was educated at University College, Galway, and graduated M.B., B.Ch., B.A.O. of the National University of Ireland in 1938. He had held the post of senior house-surgeon at Caernarvon and Anglesey Infirmary, Bangor, and was senior assistant medical officer at West Ham Mental Hospital, Goodmayes, before recently entering the R.N.V R.

ROYAL ARMY MEDICAL CORPS

Missing

Captain William Jenkins Low.

Universities and Colleges

UNIVERSITY OF OXFORD

At a Congregation held on January 22 the following medical degrees were conferred:

B.M.—H. J. Elverson, R. F. Ormrod, J. P. V. Rigby, Helen M. D. Fox, Joan P. Moignard, *R. E. M. Coke Harvey.

** In absentia.*

UNIVERSITY OF CAMBRIDGE

Titles of the degrees of M.B., B.Chir. have been conferred by diploma on Mrs. A. Davies of Newnham College.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

At a quarterly meeting of the College, held on February 3, with the President, Dr. Charles McNeil, in the chair, Dr. James Lockhart Cowan (Penicuik), Lieut.-Col. Alexander Dron Stewart (Edinburgh), Dr. Alexander Joe (Edinburgh), and Dr. John Bishop Borthwick (Edinburgh) were introduced and took their seats as Fellows of the College.

SOCIETY OF APOTHECARIES OF LONDON

The following candidates have passed in the subjects indicated:

SURGERY.—F. G. Brindley, C. N. d'E. Eastes, J. T. Hemmingway, E. R. Jordan, G. C. Kennedy, S. A. MacDonald.

MEDICINE, PATHOLOGY, AND FORENSIC MEDICINE.—E. R. Jordan, G. C. Kennedy, H. Kessel, R. L. Skea.

MIDWIFERY.—D. M. Carnegie, C. R. Deuchar.

The diploma of the Society has been granted to C. N. d'E. Eastes, J. T. Hemmingway, S. A. MacDonald, G. C. Kennedy, R. L. Skea, and C. R. Deuchar.

Medical News

Mr. G. R. Girdlestone of Oxford has been elected president of the British Orthopaedic Association in succession to Prof. T. P. McMurray of Liverpool.

Mr. Price Thomas will deliver a lecture on "Chest Injuries" at the Weston Hotel, Bath, on Thursday, February 19, at 5.30 p.m. All Service medical officers and civilian practitioners will be welcome.

A meeting of the main executive committee of the Medical Superintendents' Society will be held at the Midland Hotel, Derby, on Saturday, February 21, at 11.45 a.m., and will be followed, at 2.30 p.m., by the annual meeting of the Midland Branch of the Society.

The Nutrition Society has arranged a whole-day conference on "Food Production and Distribution in Relation to Nutritional Needs," to be held on Saturday, February 28, at 10.30 a.m., at the London School of Hygiene, Keppel Street, W.C. Papers will be read by Sir John Orr ("The Agricultural Implications of a Food Policy based on Nutritional Needs"), Dr. N. C. Wright ("Rival Claims of Animals and Man for Food"), Mr. E. T. Halnan ("Animals as Food Converters"), and Sir John Russell ("Planning for Agricultural Production").

Application is invited for Leverhulme Research Fellowships and grants in aid of research. They are intended for senior workers who are prevented by routine duties or pressure of other work from carrying out research. They are limited to British-born subjects normally resident in Great Britain. In exceptional circumstances the condition as to residence may be waived. The trustees will also consider applications from groups of workers engaged upon co-operative programmes of research, particularly from those engaged upon long-distance programmes or in institutions in which the normal facilities for research have been curtailed by the war. The duration of the awards will not normally extend over more than two years or less than three months, and the amount will depend on the nature of the research and the circumstances of the applicant. Forms of application may be had from the secretary, Dr. L. Haden Guest, M.P., Leverhulme Research Fellowships, Kingscote House, 1, Watergate, Blackfriars, London, E.C.4. Applications must be received by March 1.

The eighteenth annual report of the Ella Sachs Plotz Foundation for the Advancement of Scientific Investigation records thirty-five grants made during the year 1941 and gives a list of the investigators and the purposes of the research aided. Two workers in Great Britain received grants for endocrinological research—Dr. V. Korenchevsky of the Lister Institute, now working at Oxford, and Dr. A. M. Hain, working in Edinburgh. In making the awards the trustees favour researches that are directed towards the solution of problems of medicine and surgery or in branches of science bearing on medicine and surgery. As a rule preference is given to researches on a single problem or on closely allied problems. Applications for the year 1942-3 must reach the secretary of the Executive Committee, Dr. Joseph C. Aub, Huntington Memorial Hospital, Boston, Mass., before April next.

The committee of the William Mackenzie Memorial Fund has this year awarded the medal to Dr. A. J. Ballantyne, a former professor of ophthalmology at Glasgow University. The Fund was created to commemorate the work done for ophthalmology by the late William Mackenzie, M.D., and the medal is awarded from time to time to outstanding members of the profession specializing in the ophthalmological branch of medicine and surgery. It is customary for the recipient of the medal to deliver an address in Glasgow, and it is hoped that Dr. Ballantyne will do so in May, when the Section of Ophthalmology of the Royal Society of Medicine holds its annual meeting there.

EPIDEMIOLOGICAL NOTES

Discussion of Table

For *England and Wales* the most interesting feature of the weekly returns is the decline in the incidence of cerebrospinal fever, the notifications being 41 fewer than in the preceding week. On the basis of the experience of the past two years we should have expected the number of notifications to increase steadily during the first few weeks of the year.

The fall (108) in the notifications of diphtheria was due to the large decline in the number of cases in Lancashire—148 as against 241 in the preceding week.

Although the total for whooping-cough was less by 89, in several counties there was an increased incidence—in Wiltshire, for example, 64 cases compared with 33 in the previous week.

The number of cases of measles notified during the week rose by 73. This was mainly due to the experience of Staffordshire and London. In other sections of the country the incidence tended to decrease. For Staffordshire the figure was 98, an increase of 37 (Walsall C.B. 37, Cannock R.D. 20). For London notifications rose from 77 in the previous week to 143 (Battersea 36, Wandsworth 46).

No fresh outbreaks of dysentery were recorded during the week. The largest county totals were: Surrey 12, Middlesex 13 (Enfield U.D. 11), Lancashire 28 (Blackburn R.D. 17), Yorkshire, West Riding, 10.

In *Scotland* notifications of diphtheria fell by 38. An increase in the incidence of measles was reported from Edinburgh and Glasgow; 77 of the 96 cases in the country were notified in the former city. Although notifications of cerebrospinal fever were 8 fewer than in the preceding week, the returns for Glasgow showed an increase of 6 and accounted for two-thirds of the total.

In *Eire* the rise in the notifications of measles was due to outbreaks in Co. Dublin (Dublin C.B. 33, Dublin North R.D. 30). Twenty-three of the 54 cases of whooping-cough were reported from Co. Laoighis, Mountmellick R.D. The 10 cases of typhoid fever were contributed by five counties.

In *Northern Ireland* 22 of the 25 cases of whooping-cough were reported from Lisnaskea R.D.

Returns for the Week Ending January 31

The notifications of infectious diseases for the week included scarlet fever 1,076, whooping-cough 1,439, diphtheria 892, measles 1,235, pneumonia 1,304, cerebrospinal fever 156, dysentery 125, paratyphoid 14, typhoid 10. Deaths from influenza in the large towns numbered 90.

No. 3

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of infectious diseases and vital statistics in the British Isles during the week ended January 24.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1941					1940 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	136	6	25	3	6	303	22	65	—	16
Deaths		3	2				3	4		
Diphtheria	905	21	211	30	35	1,134	39	382	24	43
Deaths	31	2	4	4	2	42	1	10	—	2
Dysentery	103	4	37		—	63	8	54		—
Deaths			—	—	—			—	—	—
Encephalitis lethargica, acute	3	—	1		—	5	1	1		—
Deaths		—	—				—	—		
Enteric (typhoid and paratyphoid) fever						11	1	1	2	—
Deaths						2	2	—	—	—
Erysipelas			58	7	1		34	68	6	2
Deaths		1	—				2	—		
Infective enteritis or diarrhoea under 2 years	42	9	5	—	1	44	7	9	2	2
Deaths										
Measles	969	143	96	86	5	14,630	486	271*	—	2
Deaths	—	—	—	—	—	23	3	2	—	—
Ophthalmia neonatorum	83	7	11	1	—	42	1	15	—	—
Deaths										
Paratyphoid fever	9	—	1	—						
Deaths	—	—		—						
Pneumonia, influenzal†	1,158	71	18	1	14	1,573	126	38	18	23
Deaths (from influenza)	74	10	5	1	3	120	22	17	16	5
Pneumonia, primary			371	22				426	18	
Deaths		94		11	17		119		33	18
Polio-encephalitis, acute	2	—				1	—			
Deaths		—					—			
Poliomyelitis, acute	7	—	1	2	1	5	—	5	—	—
Deaths		—	—				—	—		
Puerperal fever	—	—	14	—	—	2	2	9	—	1
Deaths		—					—			
Puerperal pyrexia	145	14	25		8	154	9	19		3
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,076	33	216	35	16	1,302	82	184	36	52
Deaths	—	—	—	—	—	2	—	1	—	—
Small-pox	—	—	—		—	—	—	—		—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhoid fever‡	9	2	2	10	1					
Deaths	—	—	2							
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough	1,512	176	60	54	25	2,892	43	609*	—	28
Deaths	10	2	3	—		31	1	14	2	1
Deaths (0–1 year)	416	51	77	29	36	468	42	97	27	16
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	6,075	1,003	763	251	170	7,428	1,234	1,044	314	196
Annual death rate (per 1,000 persons living)			17·2	16·7	§			22·7	20·8	17·2
Live births	4,423	455	687	287	198	4,870	320	890	355	194
Annual rate per 1,000 persons living			14·2	19·1	§			18·0	23·6	17·0
Stillbirths	190	14	44			195	9	50		
Rate per 1,000 total births (including stillborn)			60					53		

* Notification in certain administrative areas only.

† Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

‡ Includes paratyphoid A and B for Northern Ireland.

§ Owing to evacuation schemes and other movements of population birth and death rates for Northern Ireland are no longer available.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

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QUERIES AND ANSWERS

Difficult Skin Case

Dr. R. P. CRAWFORD writes: With reference to this inquiry, Dr. A. E. Druitt (January 24, p. 135) might be asked if he has considered the remote possibility of Calabar swelling (filariasis).

Coagulants for Infected Burns

Dr. F. M. E. DAVIES (Ryde) writes: I have an idea that perhaps it is not really necessary to cleanse burns as drastically as is often recommended. It seems to me that if a good coagulum were placed over the scalded or burnt surface this in itself would prevent any harm resulting from non-cleansing. Indeed, I do not think (vide Murless's article, *Journal,* January 13, 1940, p. 51) pus would seem to do any harm, and much may be gained rather by attending to the general condition of the patient and neutralizing somewhat by means of glucose the excretion of the toxic products of burnt surfaces through the kidneys. A lot of time could be saved if coagulants could be slapped straight on to a burnt surface. I would like advice.

Sulphathiazole Ointment in Impetigo

Dr. L. B. SHELTON (Surbiton) writes: I was interested in this article by Dr. A. J. Steigman (January 3, p. 12). Up to a year or so ago I treated impetigo with ung. hyd. ammon. dil., which was successful, and used to get additional help from ultra-violet rays, which by their counter-irritant local action on the skin produced a hyperaemia and thus assisted in clearing up the infection. The same explanation applies to the beneficial effect of this treatment in acne. However, on the advent of the sulphonamide drugs I began to use them in impetigo and acne My method is to prescribe the powder or tablets of sulphapyridine, and advise the patient to make a small amount of paste with water, and having cleaned the face and sores, etc., as much as possible, to smear the paste over the affected parts and leave it on, repeating the application twice a day. Before Christmas a young man came to me with a very bad impetigo. His whole face was covered with crusts, etc., and his fellow workers were frightened to work with him. I instructed him to remove the crusts as much as possible with olive oil and cotton-wool, and to apply sulphapyridine; actually the skin of his face was so wet with discharge that I ordered him to apply the powder directly on to the skin of the face. (In severe cases I also order two tablets of sulphanilamide—7½-grain tablets—t.d.s. internally.) This case improved in a week, but the man did not return to work for three weeks because of the red marks that were still so obvious on his face. Lately I have prescribed sulphanilamide internally for erysipelas, and have also found it advantageous applied locally.

Income Tax

Premises Owned by Practitioner

"K." inquires as to the appropriate deduction on account of rent which can be made when the premises are owned by the practitioner.

*** The basis is the amount of the net assessment under Schedule A. It may, of course, happen that the house could be let for a larger sum, but in that case the amount of the Schedule A assessment—which is determined by its letting value—is too low. It is perhaps not unfair that the value should be taken at the assessed figure for deduction purposes, but fair or unfair the statute lays down that rule.

War Damage Contribution: Basis of Contribution

"W." has been assessed to contribution on the amount of the income-tax assessment as at September 3, 1939. Is this correct?

*** Yes—the fact that the property after that date was vacated or could be let only at a reduced amount does not affect the amount of the contribution.

Cessation of Practice

"P." inquires how the sale of the whole or part of a practice affects his income tax.

*** As from the date of sale the liability to account for tax in respect of the income from the practice ceases if the whole of the practice is sold, or is reduced proportionately if a fraction only is sold. For example, if one-half of a practice the net income of which is £2,000 as calculated for income-tax purposes is sold as from July 5, 1942, the former proprietor will be chargeable at £2,000 per annum for the quarter of 1942-3 ending on that date, and on 1/2 of £2,000 for the remaining three-quarters—i.e., on 1/4 of £2,000+3/4 of 1/2 of £2,000=£500+£750, i.e., £1,250: if the whole practice is sold he would be liable on £500 only.

New Practice: Owner Serving in the Forces

T. N. started in practice on October 26, 1939. In 1940 he joined the Forces, and as an absentee practitioner received only one-half the panel fees. He has been assessed for 1940-1 on the amount of his profits for the year to October 26, 1940.

*** This is correct as a basis of *assessment,* but T. N. is entitled to have the assessments both for 1940-1 and for 1941-2 reduced to the amount of the profits for each of those actual years. In the circumstances there should be no difficulty in agreeing the figures with the local inspector of taxes, who will adjust the assessments accordingly. No deduction can be made for the "capital repayment," nor for the interest if, as is assumed, T. N. pays only the net amount of interest after deducting tax at the standard rate. The wear and tear allowance of £8 may be small, but we cannot comment on its adequacy without particulars as to the nature and age of the plant, etc., concerned.

Practitioner Serving in the Forces

S. L.'s Service pay is paid directly into the partnership account, and the result is confusing as between the tax on his share and that of his partners. What can be done to simplify the accounts?

*** It is not possible for the two incomes—pay and professional earnings—to be merged and assessed by a single authority. The result of separate assessments is admittedly somewhat confusing, but the firm's accountant can usually be relied upon to straighten the matter out, to exclude the pay from the local assessments, and to see that the serving partner pays no more than his fair share of the total tax. Provided he is fully informed as to the details of the assessment on the Service pay this is not a matter of great difficulty, because he is then in a position to make the computations of the individual partners' shares of the total tax as if the assessment had been made in one sum and not separately—and of course the separation of the assessments must not affect the aggregate tax paid.

LETTERS, NOTES, ETC.

The Soldier's Water Container

Dr. J. G. FAYRER HOSKEN, D.P.H., writes: It is surely high time that attention was given to a vital part of the soldier's equipment—namely, his water container—which urgently demands remodelling. The present issue consists of a more or less rectangular tin box. The sides are rounded off, the top and bottom are set at right angles to the sides, the angle at the junction being preserved. On the top is fixed a small funnel-shaped tube which is finally closed with a cork bung, skewered to a tin top and retained thereto by a nut screwed on the lower end of the skewer. Anything less hygienic would be hard to conceive, unless we include an irremovable felted cloth cover to which the bung is attached by a piece of string. Since neither the hand nor the eye can ever explore the hidden depths of this antiquated germ-trap, the nose alone can sense the evil that is brewing within. In a tropical climate it may require a strong stomach to undertake an examination by this means. The essentials to be looked for in a well-designed container are surely that the interior should be free from any angles, open to inspection, and accessible for cleansing. In practice this would probably mean a somewhat pear-shaped vessel, preferably of a rustless alloy, having a cap of impervious material not less than 2½ inches in diameter. The cover should be removable and of washable material. The question of expense should not

be allowed to stand in the way of this much-needed reform, and the medical profession should make it their business to see that our soldiers are as well equipped as those of other nations when their health and lives are at stake.

Meyerstein's Gifts to Hospitals

Voluntary hospitals have appealed from time to time to many public-spirited benefactors, but few can owe so much to the generosity of one person as the Middlesex Hospital owes to the late Sir Edward Meyerstein. Between March, 1934, and June, 1938, his gifts to this hospital alone totalled over £242,000, and that did not include any sum for the athletic ground at Chislehurst which he presented to the medical school in 1937. Towards the hospital's rebuilding scheme he gave £155,675, and for the establishment of the Meyerstein Institute of Radiotherapy over £46,000. Two other gifts to the Middlesex during this period were of £20,000 each, and were towards the residential quarters for senior students and the hospital's maintenance fund. Other London hospitals which have cause to remember Sir Edward's generosity are St. Mary's, to which he presented a dental research laboratory and a cheque for £32,576; the London Hospital, to which he gave £12,000; the Westminster, which received £10,000 for the medical school's new building; and the Princess Elizabeth of York Hospital for Children, to which he gave 25 acres of land and sums totalling £15,000. Outside London the Queen Victoria Cottage Hospital, Tonbridge, opened free of debt in 1934 thanks to a gift of £5,000, and the Kent County Ophthalmic Hospital, Maidstone, received £7,000 for a new kitchen and equipment and for an extension to the nurses' home. He also endowed a cot in the new maternity wing of the Livingstone Hospital, Dartford.

A Convalescent Hospital for Boys

To provide during convalescence residential supervision, under an experienced youth leader, for boys between the ages of 13 and 18 is the aim of the South Coast Convalescent Hospital, Sun Hill Court, High Salvington, Worthing. All boys, regardless of class or creed, needing convalescence after medical or surgical treatment (except cases of pulmonary tuberculosis or infectious disease and also mental cases) are accepted, the weekly charge being 30s. The honorary staff includes two visiting physicians and a consulting physician, who are entirely responsible for the medical care of the boys. Low as the weekly charge is, there may be boys in need of convalescence whose parents are unable to meet the cost, and in such cases doctors can advise parents to approach charitable societies or the leading juvenile organizations which are in sympathy with the aims of the hospital. Funds are needed, because it costs more than 30s. a week to keep each boy, and although the hospital has been visited by a medical officer of the Board of Education it does not qualify for grant aid. Doctors requiring further information should write to the secretary-superintendent at the address given above.

Treatment of Scabies

Dr. K. GROGONO (Abingdon) writes: Much has recently been written about the treatment of scabies, yet I think the following family record sufficiently instructive to be worthy of note. A typical country-living working-class family, consisting of the parents and eight children varying in age from 16 to the baby who arrived during the period under observation, became infested with scabies. I tackled the treatment confidently, having had satisfactory results in a very large number of cases by now. But in this family the scabies continued. Some of them passed their tenth day apparently cured time and again, but it always returned to them all again sooner or later. After months of it I had verified that the parents were really carrying out the details of treatment extremely well, including disinfection of day and night clothes, etc. The nurse, who was school health visitor and was experienced in treating scabies, verified this and assisted with the treatment. After nine months of it even the new baby was scratching, and I confess my skin began to itch when I entered their house. It was then that I read an article in the *Journal* stating that certain animals suffered from an identical condition. Stimulated by this I made the father round up the household pets—cats only—but he rounded up about a dozen and destroyed them. The family was treated once again, all at once, exactly as before. That was all that was necessary, and now after three months I am really pretty sure that this time they will remain cured.

Tuberculin Testing in Nursery Schools

Dr. J. L. THOMAS (Brynmawr) writes: Nursery schools are now much in the news, and their coming will provide good opportunity for tuberculin skin-testing of the young children. Much less alarming, the patch test is as reliable as the Pirquet or Mantoux, and the positive or doubtful reactors should be followed to their homes in order to find the infecting case. *X*-ray examination may discover areas of fibrosis or glandular calcification, or Ghon focus, which, in the exigencies of wartime, may break down and release imprisoned Koch bacilli. As in the third year of the last war, so now, new T.B.+ cases are coming seemingly from the "blue"; this would gradually cease if the above course were consistently followed. Familial radiography may discover an adolescent male who should be warned off coal-mining, and thus help to lessen the incidence of tuberculoconiosis, now too prevalent in the South Wales coalfield. And the tragedy of meningitis, with its surprise and despair for the doctor and the indignant horror of the parents, should lose some of its poignancy because not unexpected.

Function of Discharge in Coryza

Dr. JOHN MCLAREN (Canterbury) writes: Diagnosis being largely a matter of opinion and healing largely a matter of faith, it is little wonder that doctors disagree. Consequently the letter of Dr. J. F. Payan (January 31, p. 172) was a matter of interest to me. He deprecates the "drying up" of nasal discharge in rhinorrhoea, and supports his argument by assuming the folly of suppressing urethral and uterine discharge. Nevertheless I join issue with him in the case of nasal discharge. Would he, as in the case of uterine discharge, employ a glycerin preparation to encourage the flow rather than attempt to counteract the congestion of the turbinates by astringents? If so, how does he propose to do so? At the same time I must cite a dramatic example of Dr. Payan's theory. The professor of medicine who examined me in my final clinical was an enthusiast for pot. iod. in large doses for specific disease, and impressed its importance on me. Shortly after qualifying, therefore, I prescribed, in my ignorance, a large dose of pot. iod. to a patient whom I thought was syphilitic. I was called to see him next day as he had developed a "violent cold." When I saw him he was streaming from eyes and nose—a typical pot. iod. reaction. I discontinued the pot. iod. prescription and his "cold" cleared up within the hour. My reputation for curing "colds" was made and broadcast by his family in the entire neighbourhood.

Children's Distance Test Chart

Dr. F. E. PRESTON writes: Since the monograph on my universal distance object test for children appeared in the August issue of the *British Journal of Ophthalmology*, I have introduced a method by which the use of the chart can be greatly facilitated. This will appeal more particularly to medical officers of health and to Froebel teachers who have to deal with large numbers of children not yet familiar with the letters of the alphabet. A small card has been printed bearing modifications of the twenty-one test objects used in the chart, and it only requires a minute or two for a nurse or teacher to familiarize a roomful of children with these. Later, when the individual examination is made by the M.O.H. or ophthalmologist, the children have no difficulty in naming the objects in accordance with their visual acuity. Readers who have already purchased the distance charts can receive manual cards, free of charge, from Messrs. John Weiss and Son, 287, Oxford Street, W.1.

An Argentine Surgical Journal

We have recently received copies of vol. XX of *Revista de Cirugía de Buenos Aires* (1941). This surgical journal, which is edited by Prof. Alberto Gutiérrez, is evidently of the highest quality as regards both matter and production, and will make a valuable addition to the Library of the Association. Original articles appearing in these four numbers are on: Anthrax of the Kidney (R. Ercole and A. Fort); Pylephlebitis and Abscesses of the Liver after Acute Appendicitis (R. Velasco); Acute Mesenteric Occlusion (M. Thorek); Consequences of Abrupt Decompression of Previously Obstructed Bile Passages (J. A. Sugasti); Clinical and Therapeutic Aspects of War Wounds of the Arteries (E. Lluesma-Uranga); Avelino Gutiérrez's technique in the Treatment of Chronic Osteomyelitis (Alberto Gutiérrez); Intestinal Artificial Bladder (P. O. Bolo).

A Home-made Artificial Breast

Dr. ELSIE PORTER writes: The following device may prove of use to your readers, as I used it with success on a patient recently. The patient had lost one breast and was finding a difficulty in fitting an artificial one. I suggested using a small Turkey sponge of a conical shape fitted inside a brassiere The result was excellent and had many advantages to its credit. It was not expensive, it was resilient, porous, washable, and when quite dry was firm enough to retain its shape.

The British Drug Houses Ltd. (Graham Street, City Road, N.1) have published a third edition of their technical brochure dealing with the determination of oxidation-reduction balance by colorimetric methods. It has been revised so as to bring it into line with current knowledge and practice. A copy will be sent without charge to any reader who sends a card to the above address.